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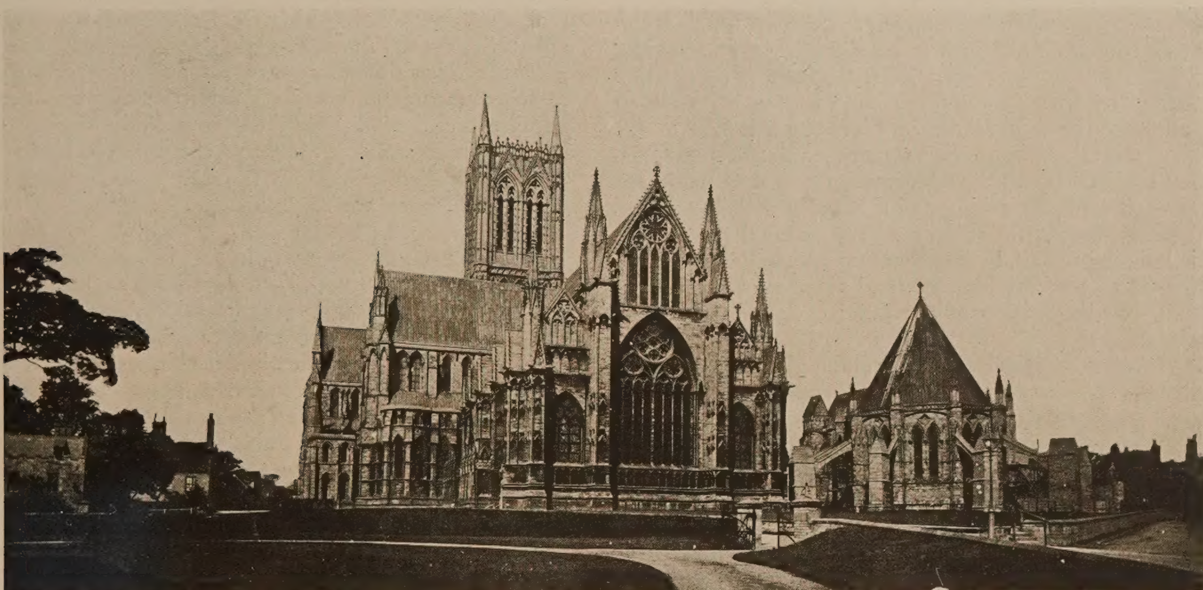
The English Chapter-House

From a Lecture Delivered at the Metropolitan Museum of Art, New York, January 10, 1920

By Albert C. Phelps, A.I.A.

Professor of Architecture, Cornell University



Lincoln Cathedral.

IN the English chapter-house we find some of the most excellent qualities of mediæval design and a work peculiarly and essentially English.

English architecture of the later Romanesque and early Gothic periods was strongly monastic. Influenced by Continental monastic work, it, however, developed much individuality and originality.

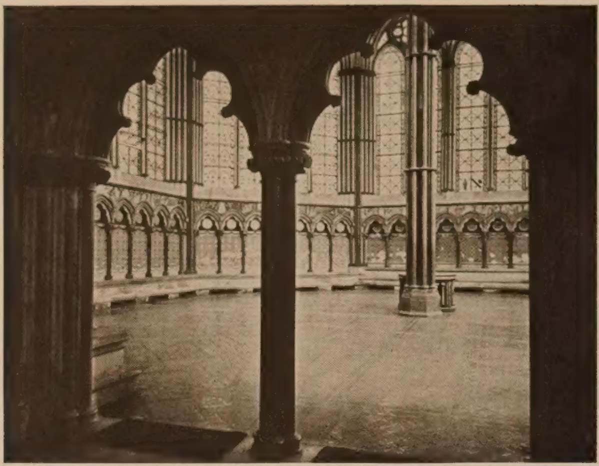
The early monasteries of the European continent, such as that at Montecassino in Italy, founded by Saint Benedict himself, have been greatly transformed or have utterly disappeared. The most important early document dealing exclusively with the architecture of a complete monastery is the plan of St. Gall in Switzerland, drawn in the early ninth century upon two sheets of parchment (measuring about two and one-half by three and one-half feet) and preserved in the library of the present monastery.

The chapter-house, along with the other usual features of the monastic group, was introduced into England and eventually became not only an essential part of the monasteries, but was added to nearly all the great secular cathedrals.

The original purpose of the chapter-house was to provide a meeting-place for the chapter of the monastery. Its convenience recommended it to the secular clergy and it became a common feature in the group of cathedral buildings in all parts of the kingdom. In it the meetings of the canons of the cathedral were held and secular deliberative assemblies were not excluded. Its picturesqueness and oftentimes artistic form added greatly to the architectural effect of the cathedral or abbey church to which it was attached, and in the development of its vaulting the highest type of Gothic structural art was reached.

The earliest chapter-houses of importance in England were built during the twelfth century. That at Durham was erected about 1150, but has been almost entirely reconstructed on its original lines. It terminates in an eastern apse and has simple groin-ribbed vaults about thirty-five feet in span.

The destruction of the original chapter-house at Durham is a marked instance of the unsympathetic attitude (to put it mildly) of the architect and clergy toward the preservation of these great mediæval works in the late eighteenth century.



Salisbury Cathedral chapter-house.

James Wyatt, who did so much damage at Salisbury and elsewhere in the name of restoration, declared the chapter-house at Durham to be in a ruinous condition and advised its demolition. In November, 1795, the work of destruction was begun by knocking out the keystones of the vaulting and allowing the roof to fall in. The eastern half of the building was then altogether removed and the remaining portion enclosed by a wall. Its interior was faced with lath and plaster, a plaster ceiling and a board floor being added. Fortunately, authentic records of the original appearance of the building remain in the form of drawings made in 1795 for the Society of Antiquaries, and these proved of great value in the restoration of the building late in the nineteenth century.

Gloucester Cathedral still retains its square-ended chapter-house, covered by a pointed barrel-vault with transverse ribs. The eastern bay is perpendicular, and it seems likely that the original termination was apsidal, as at Durham. Walter de Lacy was buried with great pomp in this chapter-house in 1085, at which time the building must have been practically completed.

Winchester had a rectangular chapter-house of the twelfth century measuring forty by ninety feet, of which but fragments remain. That at Canterbury was rebuilt and greatly modified in the late thirteenth century and again in the fifteenth. The interior was restored about 1897. As it stands now, it is chiefly a perpendicular structure, some thirty-five by ninety feet in plan, and has enormous windows at either end. After the Reformation it was used for a time as a sermon-house.

Bristol chapter-house is another with the oblong plan, but with groin-vaulting definitely pointed and having bays twenty-one by twenty-seven feet. The style is, of course, still the Norman Romanesque with the wall-arcades, interlacing arches, and chevron mouldings. This interior has been called by more than one competent authority "the most beautiful Norman chamber in England."

In these chapter-houses we see the widest vaulted spans of the first half of the twelfth century in England and a considerable development toward the Gothic vault of the thirteenth century.

In general, the Benedictine chapter-house, as it took form in England, was an oblong room about twice as long as wide, set parallel with the axis of the church and, as dictated by convenience with relation to the cloister, either north or south of the transept, from which it was separated by a narrow passage or chamber called a "slype." It usually terminated in an eastern apse, by the windows of which it was lighted, while the entrance from the cloister was by a great round archway flanked on either side by round-arched, double-lighted windows.

The Benedictine dormitory usually lay beyond or outside the immediate neighborhood of the transept, so that the chapter-house could rise to full height, there being no necessity for a story above to keep down its ceiling.

The Augustinians and Cistercians, however, with their stricter habit of night service, for convenience had the dormitory immediately abutting the transept, into which it descended by the night stair. So their chapter-houses, though following the traditional Benedictine position, had their western vestibules lower, so that the passageway from the dormitory might pass over them. The Benedictines of Chester adopted this arrangement in rebuilding their chapter-house in the thirteenth century, and it remains excellently preserved internally.

In the Chester chapter-house the vestibule opens directly from the north transept, without any slype, and its three aisles, each comprising three bays, are vaulted to four central piers, the ribs rising from the ground and are provided with no capitals. The triple openings into the cloister show the Norman tradition, refined and pointed, and to the east, separating the vestibule from the chapter-room, is a similar screen. This vestibule is entirely worthy of the beautiful room to which it forms the entrance and is a feature of rare distinction.

The Chester chapter-room is about thirty feet high, fifty feet long, and twenty-eight feet wide. It is vaulted in three rectangular bays, the vaulting being sharply pointed, and the ribs rest upon clustered shafts against the walls. The windows, triple lancets on the sides, completely fill the space between the piers, and five lancet windows occupy the end wall. We have then in this chapter-house at Chester a room on a smaller scale, it is true, but quite as completely Gothic in the application of structural principles as its contemporary, the celebrated Saint Chapelle of Paris. Indeed, these two rooms illustrate most vividly the contrast between the English and the Gallic ideals; the one broad, comparatively low and sturdy, in spite of the suppression of the wall surface; the other light, lofty, brilliant, almost sprightly in its expression.

But it was in the hands of the Cistercians that the chapter-house had its most English development. All of their monasteries being abbeys, with a system of visitation from the mother house to the daughters, considerable ac-

Salisbury Cathedral chapter-house porch.

Salisbury Cathedral roof of chapter-house.

commodation was needed for their assemblages. In the north of England, especially, rooms of great dignity were built with triple aisles of three or four bays. Few of these rectangular Cistercian chapter-houses remain, except in scanty ruins.

Furness Abbey in Westmoreland, just south of Carlisle, is a fine example of what was one of the most extensive establishments of the sort in England. The abbey was at one time exceedingly rich and the abbot exercised almost regal sway over the surrounding country. The ruins of the early English chapter-house with its entrance are especially fine. Built after the church, when the austerities of the first Cistercian style had been tempered by the passion for building, it had steep four-part vaults upon slender clustered piers, which, with their delicate carving and elaborate mouldings, represent the earliest advance of the rich North England Gothic.

Many chapter-houses of this same type were built, following the Romanesque disposition as it had been at Bristol. Later in the thirteenth century this aisled planning of the chapter-house was taken south to Netley.

But generally, except in the Yorkshire district, the earliest Cistercian houses seem to have followed the Benedictine arrangement of a plain rectangular vaulted room—square-ended, however, instead of apsed.

In the west there arose another very distinctive form, seemingly in Cistercian hands, although the earliest example known is at Worcester, built about 1140. Here the chapter-house is circular internally, externally a decagon, nearly sixty feet in diameter, and is vaulted with ten ribs to a central pier. Originally the building was circular externally, but about 1400 the exterior was refaced, made decagonal, and provided with angle buttresses, the better to resist the thrust of the vault.

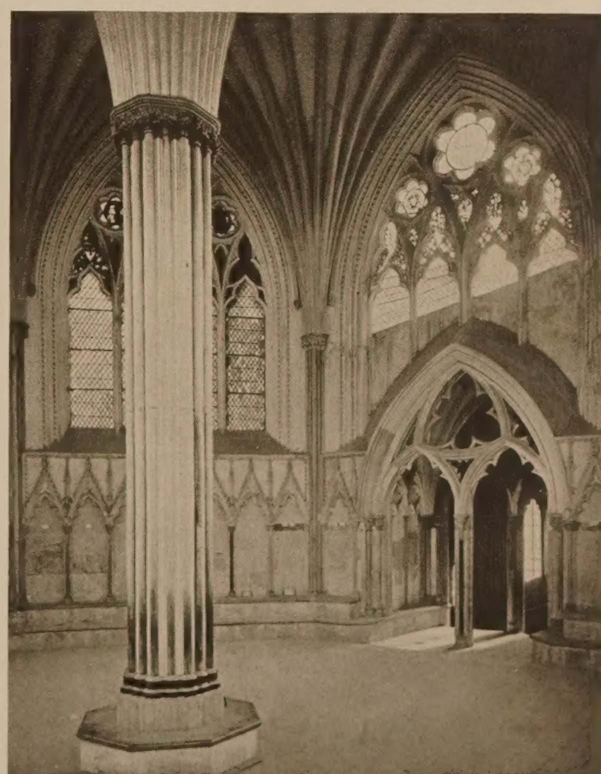
Margam Abbey in South Wales, built by the Cistercians about 1147 and now in ruins, had a chapter-house circular internally and twelve-sided without. It was about fifty feet in diameter and had twelve main vaulting ribs radiating from a central pier.

In the thirteenth century the idea of the polygonal chapter-house passed to the secular canons at Lincoln, where the ten-sided building, about sixty feet across, may possibly have been laid out by St. Hugh before 1200, though vaulted some thirty years later, when the deeply projecting flying buttresses that gave it so distinctive an exterior were added. With its accompanying arcaded passage this secular chapter-house of Lincoln Cathedral is to be regarded as a great chamber of state, a palatial appendage designed to enhance collegiate dignity and make it compete with monastic importance, and as such Lincoln seems to have led the way.

At Beverly Minster, about 1230, what was apparently the first octagon was built, which thereafter remained the accepted type of plan. There it was in two stories and, although now entirely destroyed, its office of state and distinction is to be seen in the elegant staircase that led from the north side of the canons' choir. The structure was, however, comparatively small, being but about thirty-one feet in diameter.

At Lichfield, about 1240, a chapter-house was built in the form of an elongated octagon, twenty-eight by forty feet, with a central pier to support the vault. The scheme is interesting, but not altogether happy, and apparently the experiment was not repeated. Above the chapter-room is a low chamber that now serves as a library. What its original purpose was is not certainly known.

The chapter-house at Westminster is in the form of a



Wells Cathedral chapter-house.

state apartment, octagonal, some sixty-two feet in diameter. It was built about 1250, superseding the original Benedictine hall and one side of the old penthouse cloister, the king requiring it to be designed magnificently as an adjunct for his palace as well as for the uses of the monastery, and from the time of its erection till 1282 it served as the official meeting-place of the House of Commons.

This chapter-house, like that at Lincoln, is provided with flying buttresses, which, however, project less widely.

Salisbury, too, although of secular foundation, received the idea and added a splendid cloister as well as a chapter-house; the latter being built about 1260. This is octagonal with a central pier and is about the same size as the chapter-house at Westminster (about sixty-two feet in diameter). Salisbury has less of the English power as seen in the chapter-house of Lincoln, but internally the charm is fully that of Westminster.

In the spandrils of the arcade of the chapter-house beneath the windows is a very remarkable series of bas-reliefs representing the Creation and Early History of Man, according to the Biblical account, Scenes from the Life of Joseph, etc. Although considerably restored, they retain much of the naïve quality of the early mediæval sculpture and are greatly superior to the mass of contemporaneous English work.

The chapter-house of Wells Cathedral was erected between 1260 and 1290. It, too, is octagonal and is about fifty-six feet in diameter. It is built in two stories on the north side of the cathedral, the cloister being on the south side. The upper room, which is the hall of state, is reached by a monumental staircase. Approaching Wells chapter-house, we find that it is an ideal building of its class, exhibiting the essence and quality of the English Gothic style. The under croft or crypt served as a treasury, where the vestments, ornaments, registers, and other precious things, both of the bishop and chapter, were kept. Passing into the upper hall from the picturesque staircase, we note how its canopied arcades, wide windows with the lancet traceries of central England, and richly ribbed vault sum up the tendencies of the central phase of English Gothic.

The octagonal chapter-house built in connection with the old cathedral of St. Paul's, London, was in two stories and was approached from the upper floor of a two-storied cloister. It is said to have been about forty feet in diameter and its vault was supported by the usual central pier.

This chapter-house was modified considerably in the Perpendicular period and was destroyed by the great London fire of the seventeenth century.

Elgin Cathedral in Scotland had an unusually beautiful octagonal chapter-house, built about 1280. While it displayed the national characteristics in tracery and decorative detail, its general composition followed English models.

The chapter-houses in connection with Southwell Minster and York Cathedral are the only polygonal structures of this class to be built without a central support. The one at Southwell was erected about 1280 and is octagonal in plan, measuring thirty-five feet in diameter.

Although less grand than Lincoln, Westminster, and Salisbury, it is especially charming in its decorative detail. Naturalism is perhaps pushed further than is desirable in architectural ornament, but the work is still spontaneous and some of it is not lacking in functional expression.

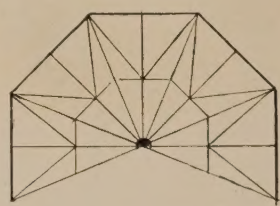
The chapter-house at York, begun in 1290, may be looked upon as the culmination of the polygonal structure. It is octagonal, nearly sixty feet in internal diameter, and with no central pier to support its vaulting.

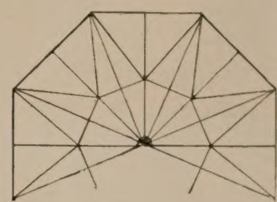
The result is a spacious interior of great dignity. The tracery and canopy details, although lacking the great charm of Wells, are effective, and the structural logic approaches that of the best French work.

The vault, which approximates more closely than any other Gothic effort outside of Italy and Spain to a real dome, arouses admiration, but æsthetically is perhaps less satisfying than some of the earlier examples where the central pier is retained. And, although the fact that reasons of economy and speed led the architect to employ timber rather than stone for his vault has offended some critics of sensitive taste, there is no mechanical reason why masonry might not be substituted.

The chapter-room is approached by a fine vestibule, and, in spite of minor defects, York chapter-house in picturesqueness of massing and in spaciousness and dignity is unsurpassed. Unlike most of the English chapter-houses, York still retains much of its splendid mediæval window-glass.

It may be of interest to consider the two lines of reasoning followed in the treatment of the polygonal vault with the central pier as employed in the chapter-houses.





In the one the vault was assumed to span from the sides of the polygon to the central pier; in the other from the angles to the pier. The former appears at first to be the more natural, but has the disadvantages of breaking the principal side of the vaulting compartment that rises from the corners into a resalient angle, and also making the main ribs from these angles across to the central pier in half their length transverse ribs and in the other diagonals; and of making one half represent a receding and the other a projecting angle, while the angle ribs of the outer half meet the transverse ribs of the inner half of the vault. The outer vault is cloistered, the inner groined.

These objections are entirely obviated by supposing the main vaults to run directly from the angle to the pier. In either case the ridge that surrounds that half of the vault which springs from the central pier takes the form of an inner octagon. In the first case the sides of this are parallel to the walls, while in the second they take an intermediate direction, the angles of the inner octagon being opposite the centres of the outer one. The vaulting compartments that rise from the angles of the great octagon are exactly like those that rise from the central pier, and the ribs that rise from the angles to the pier are throughout transverse ribs, while the angle ribs from each side regularly meet one another.

This latter method of vaulting was the one adopted in nearly all the finer structures, as Westminster, Salisbury, Lincoln, and Wells, while at York the inner octagon is parallel with the outer one, but the difficulties are avoided by dispensing with the central pier.

I think most of us will agree with Sir Gilbert Scott, who declared that few forms in any style of architecture present such beauties as an octagon vaulted in this manner.

(*Continued on page* 102.)

WELLS CATHEDRAL, SHOWING CHAPTER-HOUSE.

WORCESTER CATHEDRAL, RUINS OF GREAT HALL. CHAPTER-HOUSE AT RIGHT.

(*Continued from page 100.*)

Although built as adjuncts of greater structures, and in a measure overshadowed by the greater glories of the churches to which these chapter-houses are attached, there is a unity and directness of purpose about them rarely found in the larger buildings. And in spite of the fact that some of them, such as Lincoln, Westminster, and Salisbury, have been so far subjected to restoration as to lose much of their ancient charm, there is still in the character of this broad English designing evidence of the native vigor of the middle thirteenth-century ideal.

England has produced greater structural works and more imposing architectural monuments, but nothing more unique and spontaneous than her chapter-houses.

Big Building Has Right of Way

A Forecast for 1920

By Perley F. Ayer

Chief Planner for the Aberthew Construction Company

RECESSIONS in business, with accompanying recessions in prices, have recently been predicted in some quarters. Hope has been expressed of sagging demand for building materials and labor, with consequent reduced costs of construction, for whose advent owners are being advised to wait.

If, however, the figures recording past experiences are to be trusted, such advice is pretty poor; unless, indeed, owners are prepared to put their plans in their pockets, to be kept there not for two months but for two years. In short, 1920 promises to be, both relatively and absolutely, the greatest building period that the United States has ever known.

History has a way of repeating itself. The volume of contracts let in the early months of any one year constitutes a pretty reliable index of the total volume that will be booked during the entire twelve months. The F. W. Dodge reports issued for that part of the United States east of the Missouri and north of the Ohio Rivers record the percentage of the year's contracts which have been awarded in each month of the twelve during the past ten years, 1910–1919. They are as follows:

January	5.4 per cent	July	9.7 per cent
February	5.7 per cent	August	9.3 per cent
March	7.2 per cent	September	8.1 per cent
April	8.6 per cent	October	10.0 per cent
May	9.6 per cent	November	7.7 per cent
June	11.9 per cent	December	6.6 per cent

If these percentages hold, as they should, during the coming months the Dodge reports for January should supply the prophetic finger with which to write in advance the total for 1920.

It so happens that January's awarded contracts are reported at $235,000,000. In order to keep on the side of conservatism, let it be assumed that this will prove to be 6.5 per cent of the year's total, rather than the 5.4 per cent of the ten-year average. The result still indicates that the stupendous sum of $3,620,000,000 is to be spent on construction during 1920.

To be sure, these billions of dollars are really billions of fifty-cent pieces, and offer no immediate basis for comparison with the actual volume of construction in previous years. But, again, the Dodge reports come to the rescue with a table showing increase in building costs since 1910. Setting the costs of 1910 at 100 per cent, the Dodge table shows unchanging percentages through 1915. In subsequent years the climb proceeds as follows:

1916	117 per cent
1917	139 per cent
1918	159 per cent
1919	190 per cent

Brought to a common denominator of dollar-value building, volume since 1915 would appear thus:

	VALUE IN DOLLARS	DISCOUNT VALUE, OR TRUE VOLUME
1915	$ 940,090,000	$ 940,090,000
1916	1,356,990,000	1,158,000,000
1917	1,618,157,000	1,165,000,000
1918	1,689,242,000	1,055,000,000
1919	2,559,625,000	1,350,000,000
1920*	3,620,000,000	1,905,000,000

The upshot of these figures is that instead of approaching a recession in building we are, apparently, on the verge of a construction demand 40 per cent in excess of anything previously encountered.

Whether or not this volume of construction will be accomplished is a question whose answer is to be found not at all in pressure of demand, but exclusively in means of supply. Here exists a serious problem. During 1919 the shortage of materials and the uncertainty of their delivery, the insufficiency of labor, and the disorganization of transportation constituted the most serious impediments to the fulfilment of contracts within reasonable limits of time and price.

There is no sufficient reason to anticipate improvement in any of these particulars during 1920. A good many organizations, already creaking under existing strains, are likely to crack under the added burdens which will begin to blossom with the spring, and will grow and ripen with the expanding year. Not all projects launched will be brought to a triumphant conclusion.

In so far as these notes constitute a warning, however, they are not to be interpreted as a warning against undertaking building in general, but only against attempting certain kinds.

* Potential business based on January awards.

Colors Employed in Egyptian, Greek, and Gothic Architecture

By Albert M. Kreider

THE Egyptians were a people highly civilized, skilled in all the arts as far back as 6000 B. C., particularly in the employment of colors in architecture. They used various colors, such as red, yellow, blue, green, and white to decorate their monuments. Long-disused types of capital were revived and others greatly elaborated; and the symmetry rather Greek than Egyptian. With the exception of a few useful vaulted structures, all Egyptian architecture was based on the principle of the lintel. Artistic splendor depended upon the use of painted and carved pictures and the decorative treatment of piers and columns produced in halls like those of Karnak, of the Ramesseum, or of Denderah, having a stupendous effect by their height, massiveness, number, and colored decorations. The simplest piers were plain shifts; others, more elaborate, had lotus flowers or heads of Hathor carved upon them. Every part of the column was richly decorated in color. Lotus leaves or petals swathed the swelling lower part of the shaft, which elsewhere was covered with bands of carved pictures and hieroglyphics. The capital was similarly covered with carved and painted ornament, usually of lotus flowers, or leaves and papyrus.

The Greek mind, compared with the Egyptian, was more highly intellectual, full of logic and symmetry, and the communication of the Greeks with the Egyptians may have induced them to imitate the latter in the application of colors to ornaments. It seems to be a taste for colors and not the intention of rendering the different parts of a building more distinct from each other and substituting painted ornaments for ornaments in relief. The fact that Greek temples were colored on the exterior was a remarkable discovery, for the application of colors to their external decoration seemed to be rejected entirely.

It has been proven after many years of debating that all these parts, so severe and dignified in their simplicity of form, received a rich decoration of color. It is impossible at this day not to admit that it was among these people that the alliance of colors with architecture was made, and at a period when monuments were erected in the best style; while the precise shades and tones employed cannot be predicted with certainty, it is established that triglyphs were painted blue and the metopes red, and all the mouldings were decorated with leaf ornaments such as "egg and darts" and frets in red, green, blue, and gold.

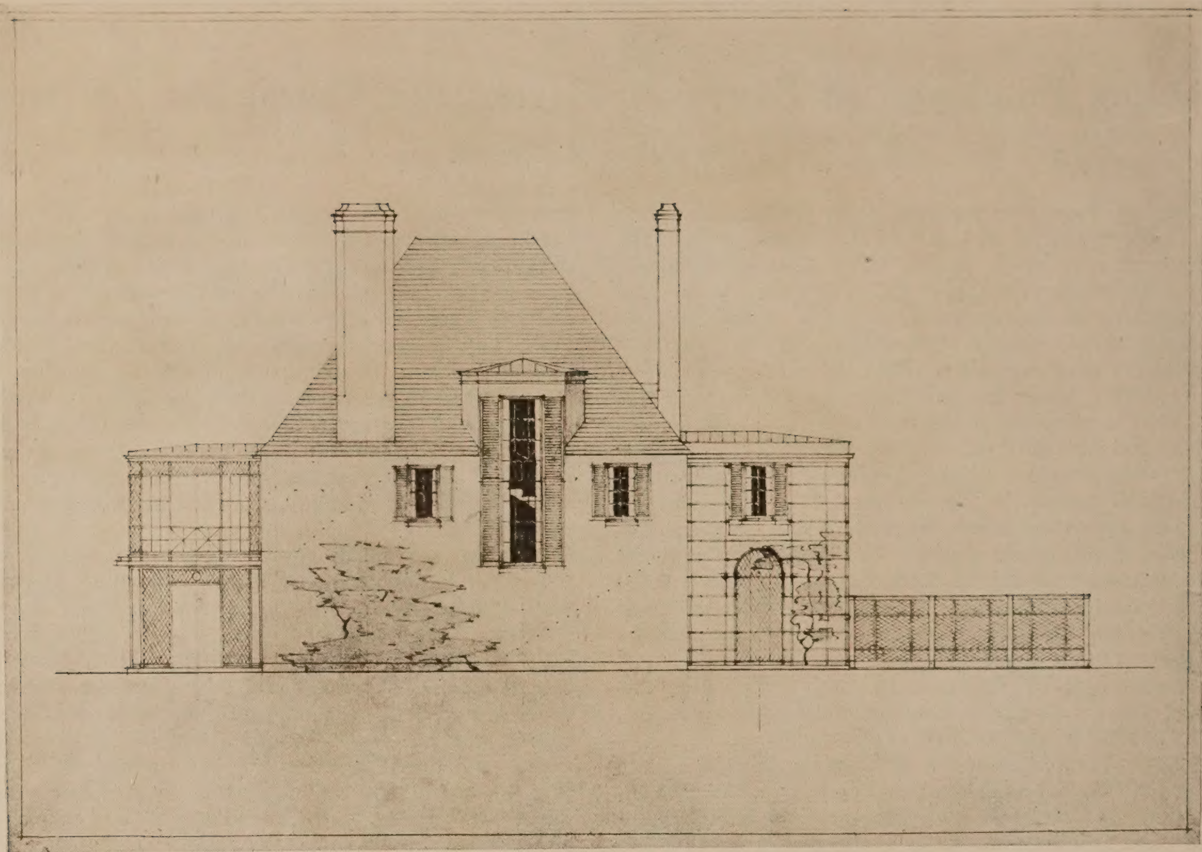
The walls and columns were also colored, probably with pale tints of yellow or buff to reduce the glare of fresh marble or the stucco-covered surfaces of masonry. The outlines against the sky in the clear Greek atmosphere, the Greek temple must have presented a rich aspect of sparkling gayety. In fact, the ruins of colored temples that were discovered by the excavations made in Greece, Italy, and Sicily have this characteristic in a remarkable degree. In the colored drawings of Greek monuments which you may have seen, you may not only notice the number of colors employed in these monuments—white, black, red, yellow, green, and blue—but also the use which has been made of them under the relation of variety and purity of tint, of distinct view of the parts, and of the harmony of the whole.

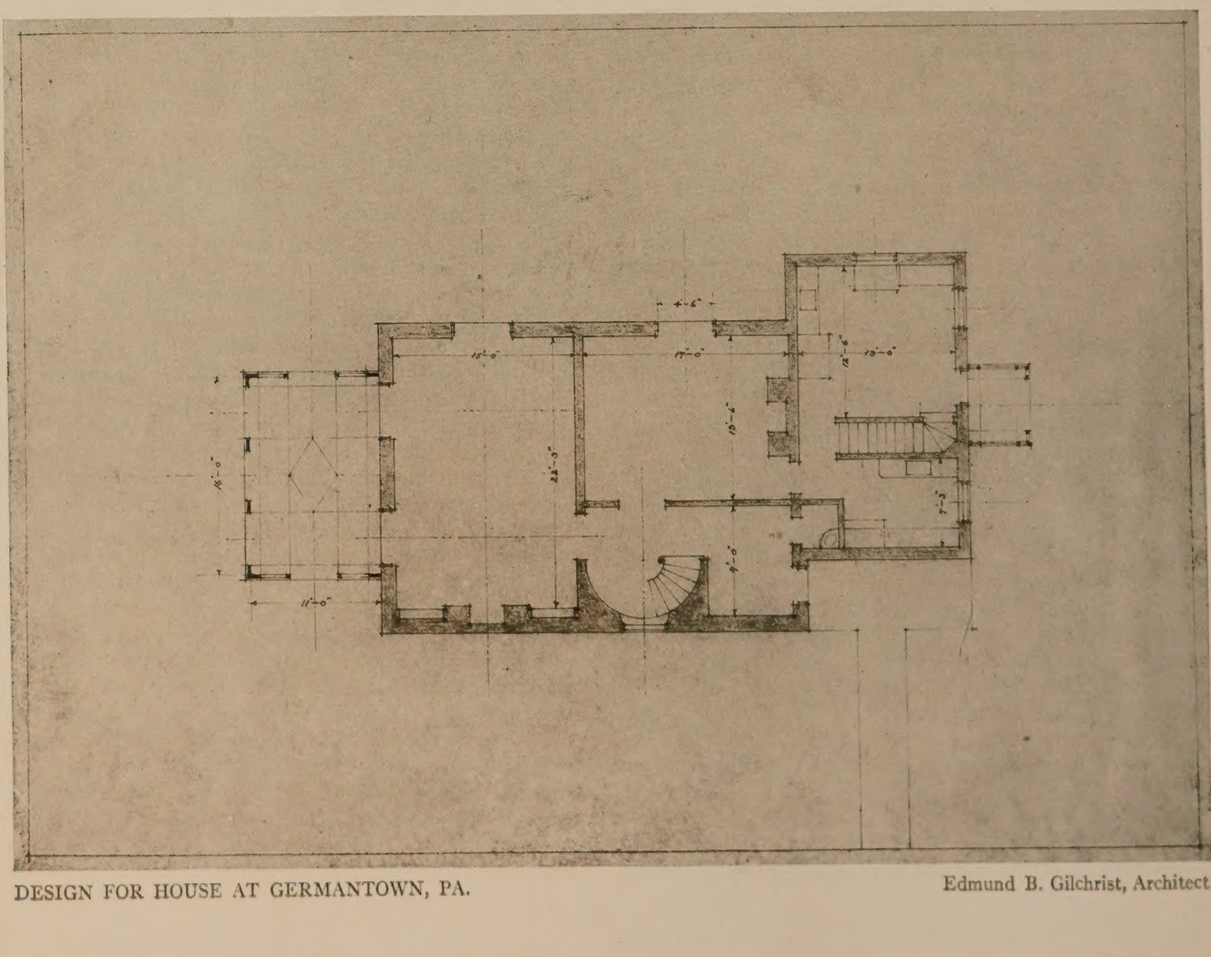
For instance, the principal lines, as the fillets of the architecture and of the cornice, are red; the mutules blue, and their guttæ white; the triglyphs blue, their channels black, and their gutter white; and the more extended parts of the frieze and the cornice, as well as the architrave, are of light yellow. We see that the greater part of the principal lines is indicated by a brilliant red, and the association of blue with black in the triglyphs and their channels formed a harmonious and distinct union of the neighboring parts; also light yellow, the dominant color, produced a much better effect than if the most intense or sombre colors had predominated. After all, the colors were distributed in the most intelligent manner possible, without being motley. It presented a variety and lightness in the tints with easy separation of parts.

In the great Gothic churches, color has rarely been employed on the exterior, except in a few cases, and always without injury to the general harmony and in a restrained manner. The color in the niches and on porches were of very little importance in this point of view, and in almost every case it was added long after the erection of the structure on which it is found. One thing to be admired in these vast edifices is the art or luck with which they have succeeded without color, having recourse to architecture and sculpture only in presenting to the exterior of the structure a variety which in no respect destroys the imposing and natural effect of the whole.

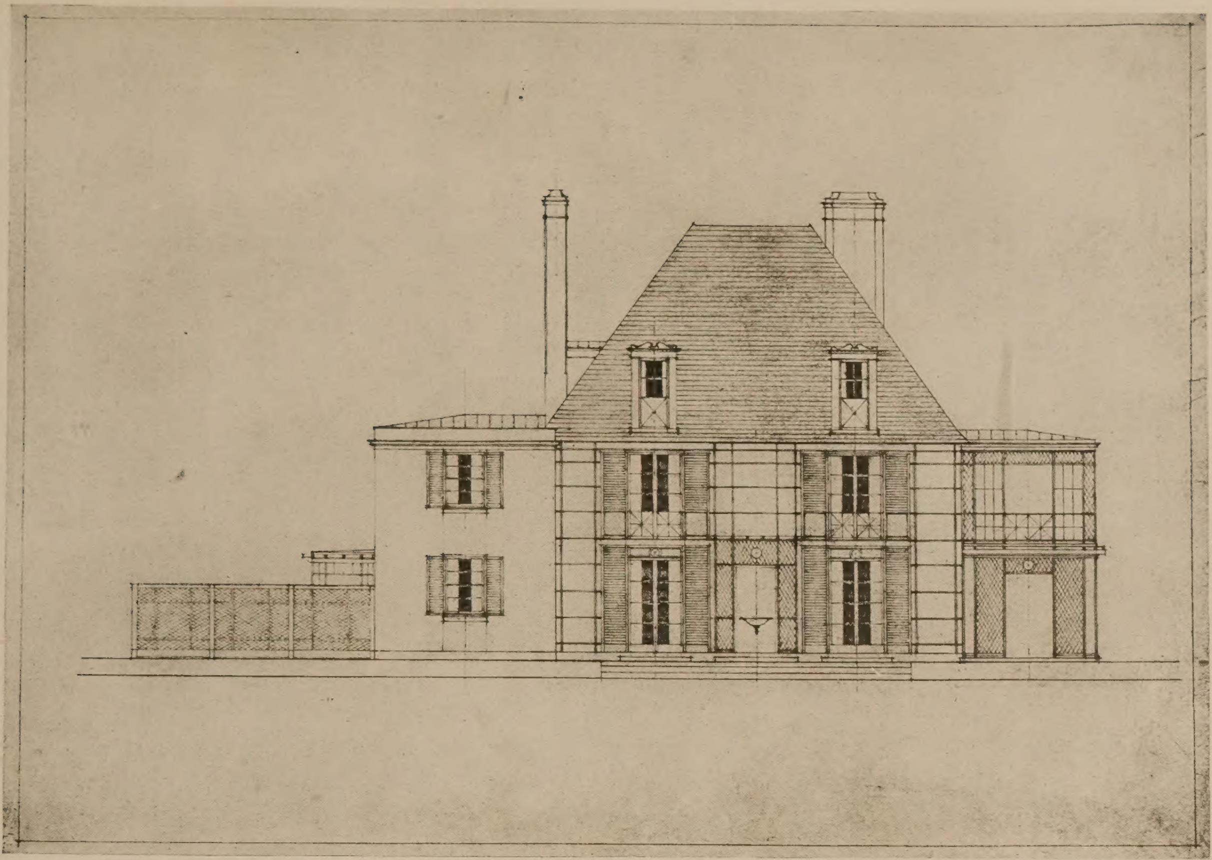
Speaking now of the interior of these churches, the ethereal colors of stained windows will complete the enjoyments which seem to strengthen the power of religious sentiment in all those who enter these edifices to impart their prayers to God.

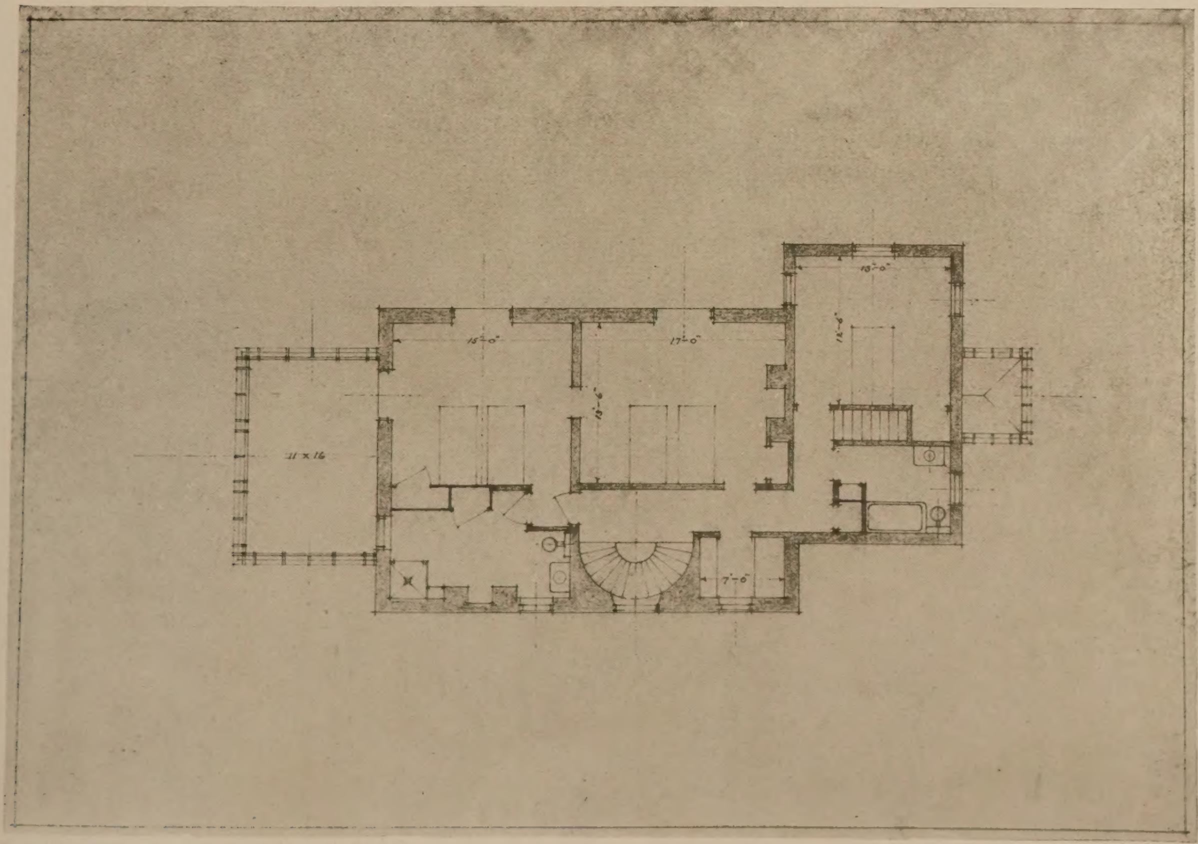
An author of a work full of research, whom I have in mind, thinks that the ceilings of Gothic churches ought to represent the celestial vault, and be painted blue, studded with gilt stars. It is a fact that painting has, from the very beginning, really concurred with architecture, and even with painted sculpture in the interior decoration of Gothic churches; it was only on the system of flat tints and in a secondary degree from the time it was decided to use windows of stained glass; for not any painting that was applied upon an opaque body, such as stone, wood, etc., could sustain itself beside the brilliant colored light transmitted by the glass. According to the rules of chiaroscuro, if this painting had been graduated, all its merit would have disappeared for want of crystal and white light, the one kind suitable for illuminating it. As an effect of harmony, one might say that the vicinity of stained glass requires painting on the contiguous walls. Without deciding altogether in favor of the negative, I confess that after reflecting upon the deep impressions that you receive in great Gothic churches, where the walls present only the simple effects of light and shade upon a uniform surface of stone, when there are no colors except those transmitted by the stained glass, I will say that the sight of more varied effects would have appeared to me an error against the principle of good quality. This opinion was especially strengthened after seeing the fine vault of the ancient cathedral at Rheims, which had been painted for the coronation of Charles X. It was a field of blue, sprinkled with fleurs-de-lis. This beautiful example leaves a deep impression on you.





DESIGN FOR HOUSE AT GERMANTOWN, PA. Edmund B. Gilchrist, Architect.





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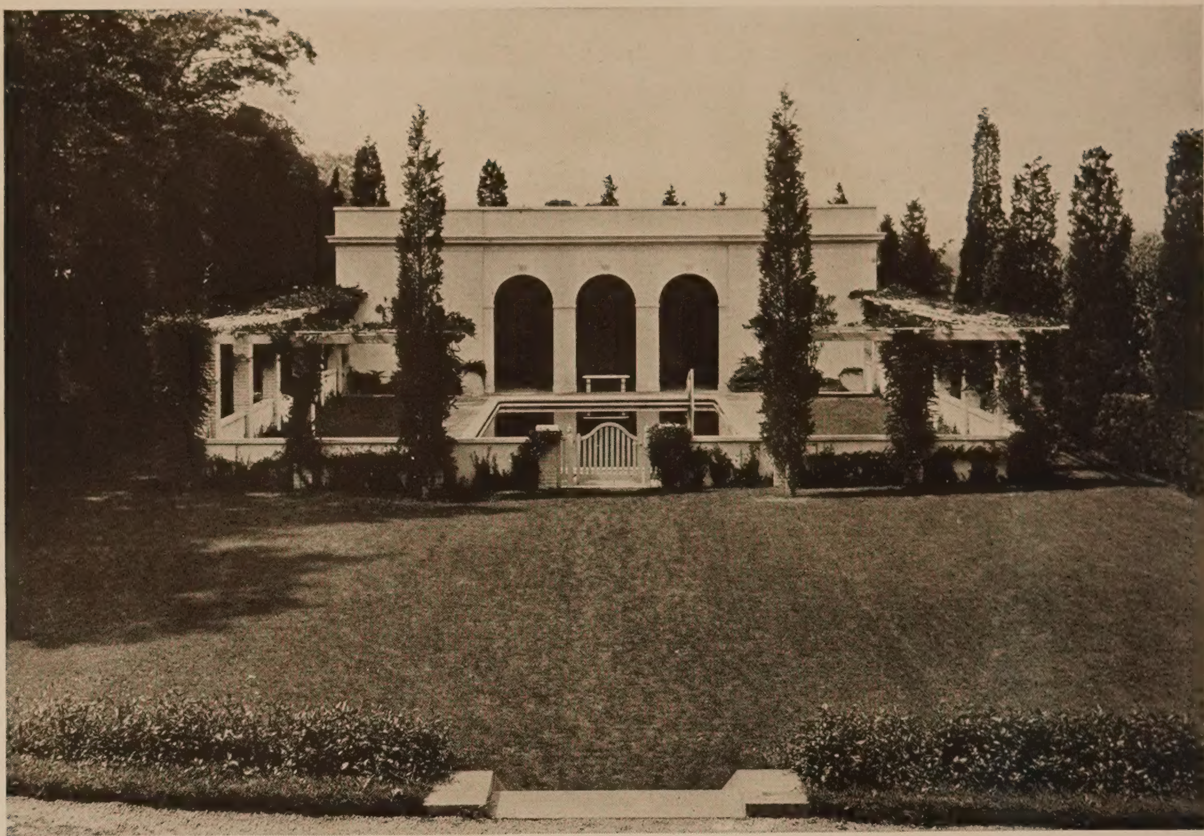
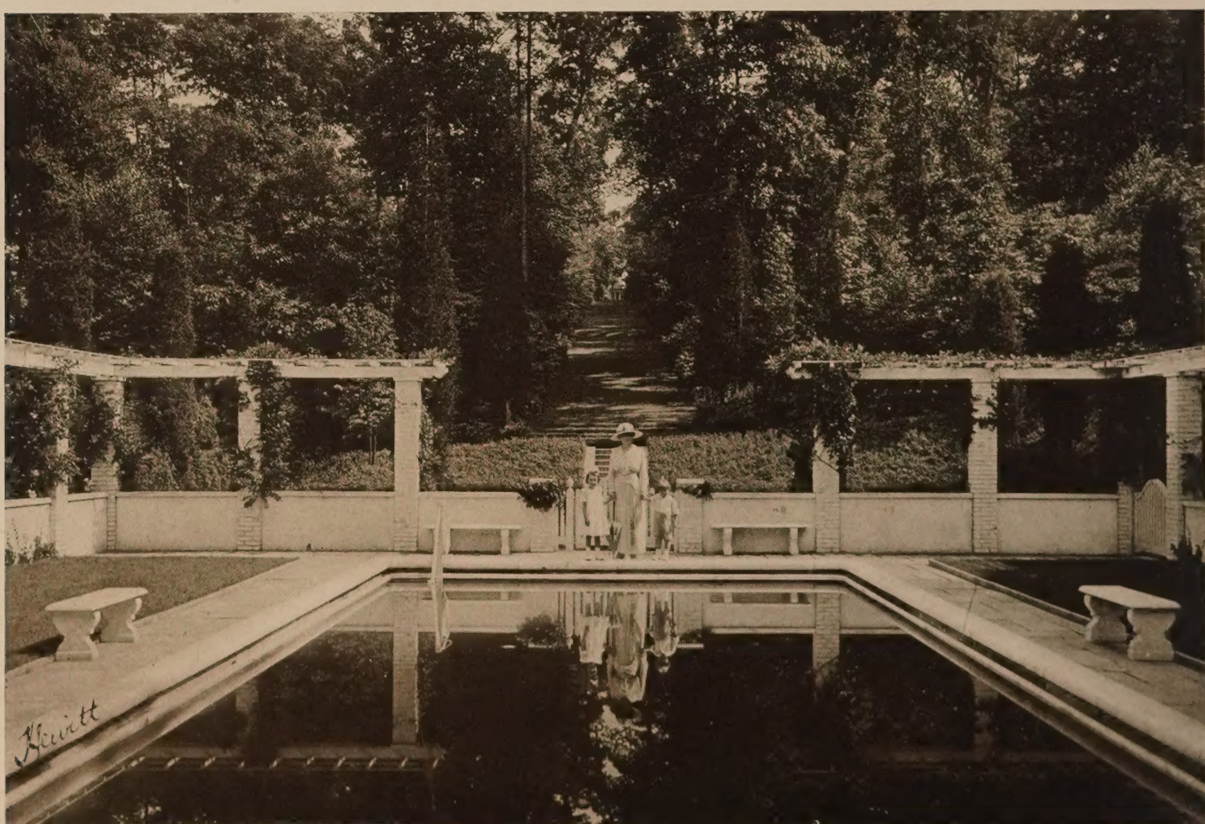




SWIMMING-POOL FOR ROBERT E. BREWSTER, AT MT. KISCO, N. Y.   Delano & Aldrich, Architects.

Editorial and Other Comment

Our Architecture as History

NONE of the arts are more closely identified and expressive of the civilizations that gave them birth than architecture. It needs no words to suggest the significance of Greek culture as manifested in the Parthenon, nor is there any doubt of the character of the races that built the pyramids and the great Egyptian temples. In England and France the cathedral builders wrote the thoughts of the times in the wonderful and beautiful structures that have made Gothic a symbol of worship and a manifestation of the spiritual mood of the time. The marvellous church of St. Sophia at Constantinople embodied the best culture of the East when Byzantium was a world power, and so on through the whole gamut of the ages.

What will the future generations think of the American architecture of our time? How will they relate it to our civilization, how interpret the meaning of the sky-scraper in terms of human endeavor and thought. Will our steel cages last long enough to become historic exhibits? Our Georgian or Colonial period will have become a thing of the past, for the old houses are now fast disappearing and there is nothing so individual and distinctive to take their place. There will be little doubt of a realization of the fact that in our cities we lived and worked as bees in the hive. Some of our great business palaces will show how crowded we were in working hours, and that some of them must have held the population of a small city. There will be manifest the need of building toward the sky in lieu of the obvious lack of space for basic expansion, and as we look upon the great blocks of the pyramids, the columns of Luxor, so maybe will the future at our high buildings. They will wonder at the skill and splendid courage, the enterprise, the daring and assurance that made them possible, even if only here and there they find notable evidences of the things that are called art, the refining arrangement even of big things, design in keeping with the money lavished and the opportunities offered to men of genius. It would be interesting to read their comment on such structures, say, as the Flat Iron Building, when they come to discover the great masses of steel at the angles that were put in it to enable it to resist the tremendous strains to which it must be subjected. We shall be thought of at least as a people of wonderful engineering knowledge and commercial enterprise. Our high buildings and the remains of the great bridges throughout the country will leave no doubt of this.

Without a Home

WE have been writing from time to time of housing conditions. As a matter of fact, the subject has long since passed the theoretical stages, the state of discussion in general terms. There is no more vital topic before us, nor one that calls for a more immediate practical solution. Our cities have grown in population with tremendous strides, while the building of places where people may live has been at a standstill. The result is a constant advancement in rentals with an equally constant inability on the part of hundreds to meet these advances. The owner of property is governed by the demand and rents his space to the highest bidder. The tenant who for years has met his obligations, who has remained in spite of the offer of other agents of newer and better quarters at a like or even a less rental, receives no more consideration than the tenant of yesterday. Pay the advance or get out is the answer. This condition has ceased to be one of merely ordinary business. In many cases it has and will continue to create a state bordering on panic. Thousands who are employed in our cities whose incomes are fixed are unable to meet the competition of those who have made money by the war, and they are confronted with the fate of those subject peoples who have been driven from their homes by a marching horde of conquerors.

We present the following significant figures compiled by Mr. Wharton Clay, Commissioner of the Associated Metal Lath Manufacturers:

"With a conservative estimate of 27,900,000 families in 1925 the great housing shortage will continue unless building in all parts of the country increases to an extent unparalleled in the history of the construction business.

"If only the current number of homes are constructed each year for the next five years 409,500 homes must be built, and the congestion will reach 129.6 families per hundred homes or 2 families in every fourth house.

"Merely to keep up with the increasing number of families and in no way alleviate the present congestion 2,139,000 homes have to be constructed before 1926, while a return to the pre-war conditions of 115 families per 100 homes means the building of 3,340,000 dwellings in that period. When it is considered that in a town of 25,000 this construction programme means 475 and 750 homes in five years respectively, the stability of the building industry becomes apparent.

"The following table shows how, for the last three decades, the number of families in the country has exceeded the number of dwellings:

	FAMILIES	DWELLINGS
1890	12,690,152	11,483,318
1900	16,187,715	14,430,145
1910	20,255,555	17,895,845
1915	22,786,499	19,853,517
1916	23,292,887	20,263,051
1917	23,799,275	20,672,051
1918	24,305,662	20,808,562
1919	24,872,051	20,829,039
1920	25,319,443	20,900,000

Concrete Housing

THE recent National Conference on Concrete Construction in Chicago brought out a great deal of helpful and practical discussion. None of the papers read seems to us more to the point from the architect's point of view

than that by Irving K. Pond. There is no question of the almost immeasurable usefulness of concrete construction.

"My first item of advice, if I may be permitted to offer advice to a body of men interested in the development of or handling a comparatively new and altogether worthy building material, is to treat the product with respect, to shun and scorn imitations, to recognize limitations, which attach to all materials, as well as to all men, and to work within those limitations. This is not saying that because a thing has been done, and frequently and appropriately done, in one material it shall not be done in another or a new material which may be employed with equal propriety; however, the new material should not employ forms which are purely distinctive of the old, but should develop forms which inherently characterize the new.

We are of the opinion that there are few better ways of quickly meeting some of the present housing needs, than by a wide use of concrete. With an architect to design and give attractive form to the houses that may be constructed, there are charming possibilities. In France they are building some most attractive little houses of concrete slabs, some of them with surprising rapidity—a matter of only two or three days.

Concrete is a material which lends itself to many kinds of manipulation. It can be cast, poured, pressed, assembled in the shop or on the job; it can be applied in liquid or in solid form to the work immediately in hand. So many are the possible methods of its application—such a diversity of means may be employed toward its legitimate ends, that some of its enthusiastic sponsors see in it a panacea for structural ills and possibly for æsthetic building ills, a substitute for all previously employed building materials—excepting, possibly, door hinges—and a perfect end in itself."

Beaux-Arts Institute of Design

Free courses in instruction in architectural design, sculpture in all its branches, mural paintings, and interior decoration. In the course of architectural design, there is a registration fee of $2.00 per annum required; in the other courses there are no fees of any kind.

PURPOSES OF THE INSTITUTE

To furnish instruction in the arts of design at a minimum cost to students. To bring art students under the criticism of artists who are engaged in active practice. To carry students beyond the academic study of the arts into the province of their application and practice. To bring about co-operation among the various art schools of the country. For this purpose it is desired that students, whether studying at other art or architectural schools, or organized in clubs or working independently, take part in the competitive work laid out for them, and that the instructors of such classes take part in the juries of award. To provide young artists of proved talent with studios and materials to perfect their art. To allow art students to study throughout the year uninterrupted by holidays. To provide young artists of proved talent with studios and materials to perfect their art.

Circulars of information may be had by addressing the Institute at 126 East 75th St., New York.

Book Reviews

"A HISTORY OF THE METROPOLITAN MUSEUM OF ART." Published by the Museum.

"The History of the Metropolitan Museum of Art," written by Miss Winifred E. Howe, is a volume of medium octavo size with xvi+361 pages, and numerous portraits, views of buildings, plans, and facsimiles. It contains, besides the history proper, an introductory note by the president, Robert W. de Forest, and an Introduction on the Early Institutions of Art in New York, including the American Academy of the Fine Arts (1802–1841); the New York Historical Society (established in 1804); the National Academy of Design (established in 1826); the Apollo Association (1839–1853); the New York Gallery of the Fine Arts (1844–1858); the Cooper Union (chartered in 1859); and several institutions of minor importance, such as the American Museum of John Scudder, Peale's Museum, Browere's Gallery of Busts and Statues, Old Paff's Gallery, John Vanderlyn's Panoramas, the Old Sketch Club, the Düsseldorf Gallery, and the Crystal Palace Exhibition.

The history proper is divided into seven chapters dealing in order with the period of organization, from 1869–1871, the Museum in the Dodworth Building during the years 1871–1873, in the Douglas Mansion from 1873–1879, the first years in Central Park from 1880 to 1888, the first addition to the Park building, 1888 to 1894, and its continued extension in 1895 to 1905, and the period under the presidency of J. Pierpont Morgan beginning in 1905.

"To write the life story of an institution requires exercise of that bravery which is proverbially assumed to be especially favored by fortune. Biography has the prop at least of some one striking personality with which to support the interest, too often limp and apathetic, of the general public, but the long corporate existence of an institution, though it may plead with any individual a precarious infancy and a youth of noble struggle, demands a special talent in its historian if the narrative is to win deserved recognition. Such sympathy and understanding are brought by Miss Winifred E. Howe to her 'History of the Metropolitan Museum of Art' (the Metropolitan Musuem of Art, New York). She has added further a chapter on the art institutions in old New York, which, as it were, gives the reader the ancestral tree of this now famous gallery."

"MODERN FARM BUILDING." New and enlarged edition. By ALFRED HOPKINS, A.A.I.A. Robert M. McBride & Co., New York.

Mr. Hopkins needs no introduction to architects or any qualified comment upon either his authority or his wide and special knowledge of his subject. He has specialized in this field for a number of years, and his book is the outcome of practical experience as well as a theoretical knowledge of architecture. The volume includes farm buildings from the smallest establishment to that of the large estates. All types of construction are shown and buildings for various kinds of stock. It is up-to-date and in keeping with the best modern ideas of farm management.

"ESTIMATING CONCRETE BUILDINGS." By CLAYTON W. MAYERS. Published by The Aberthaw Construction Co.

Estimating the cost of constructing concrete buildings is a process concerning which most architects, engineers, and contractors have still much to learn. Indeed, in so far as is known Mr. Mayers' modest volume is the first to be published on this subject.

Pioneer though it is, "Estimating Concrete Buildings" is an extemely clear and well-arranged treatise. Starting with the most elementary considerations, it explains each successive step in estimating a building, part by part. The sum of the parts constitutes a complete estimate, which is reproduced in facsimile. An additional section discusses methods of establishing unit costs.

"A HISTORY OF EVERY-DAY THINGS IN ENGLAND. DONE IN TWO PARTS OF WHICH THIS IS THE SECOND. 1500–1799." Written and Illustrated by MARJORIE and C. H. B. QUENNELL. Charles Scribner's Sons, New York. London, B. T. Batsford.

Primarily written for young people, this interesting book contains much information both entertaining and instructive for grown-ups. It has a good deal to say about the development of architecture and the customs and ways of living of the people who lived in the types of buildings shown, and there are a series of drawings that give details of the development of ships from the time of the Mediterranean galley to the days of the famous tea-clippers. The plates of costumes should prove of value to those interested in designing clothes of a particular period. The book contains the kind of every-day information that is often difficult to find with an admirable series of line drawings that add much to its usefulness and interest. Both of these volumes contain many architectural drawings and details of household furniture. They take one into the homes of the people from the time of Elizabeth to the Georgian period.

MANTEL AND FIREPLACE IN LOBBY, JOHN LEVY GALLERIES, 559 FIFTH AVENUE, NEW YORK. Rouse & Goldstone, Architects.

MR. LEVY'S OFFICE, JOHN LEVY GALLERIES, 559 FIFTH AVENUE, NEW YORK.

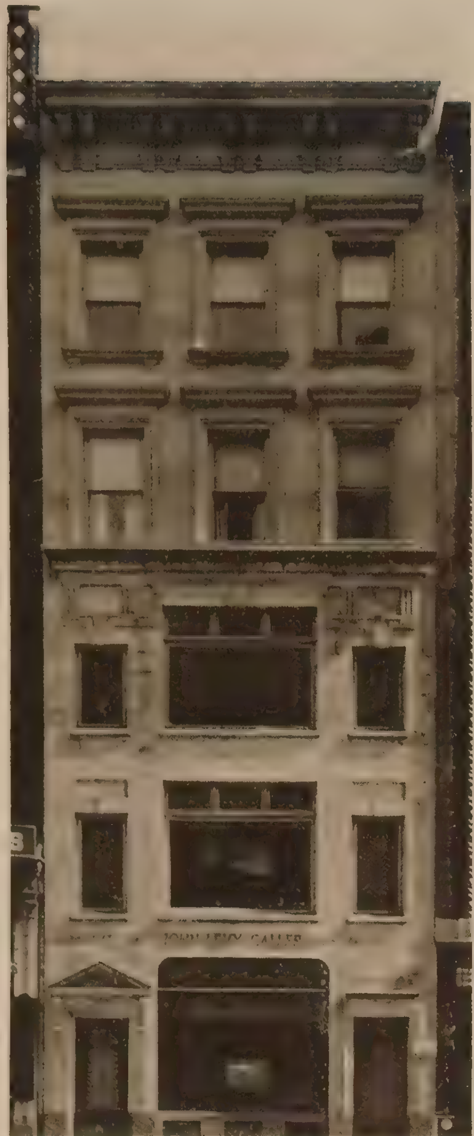
Rouse & Goldstone, Architects.

LOBBY.

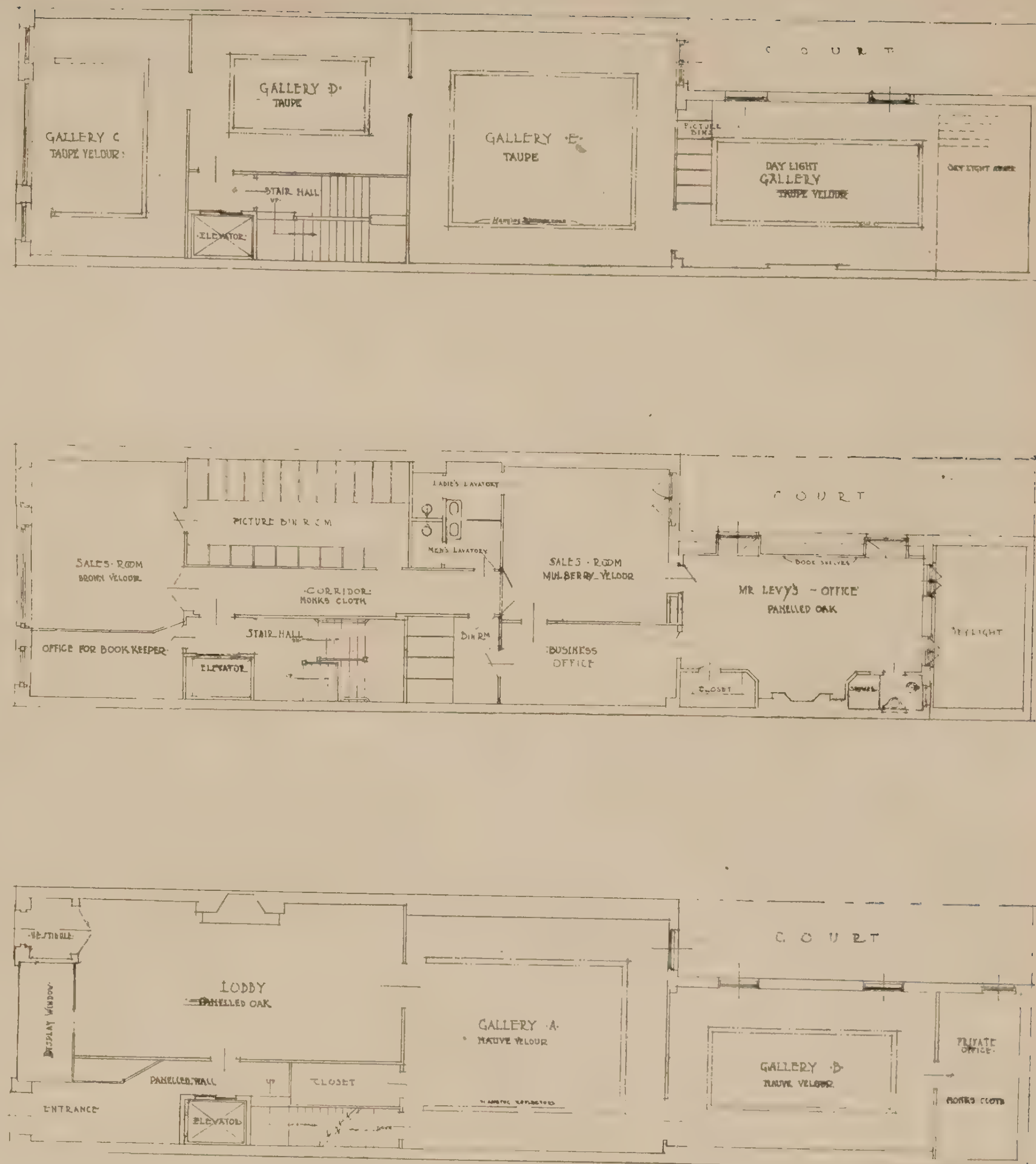
TYPICAL PICTURE GALLERY.

Rouse & Goldstone, Architects.

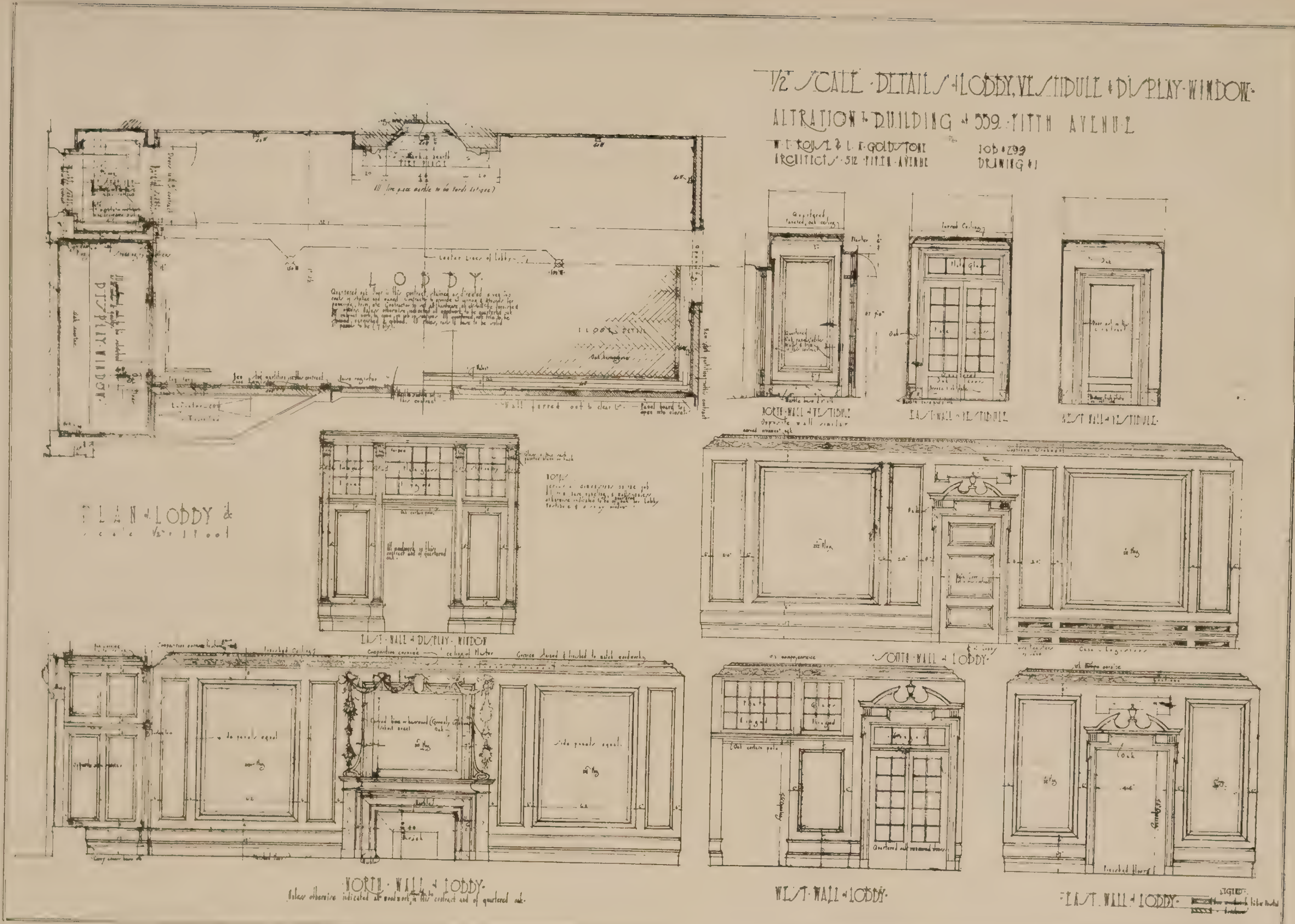
JOHN LEVY GALLERIES, 559 FIFTH AVENUE, NEW YORK.



ALTERATION, EXTERIOR, 559 FIFTH AVENUE, NEW YORK. Taylor & Levi, Architects.



PLANS OF JOHN LEVY GALLERIES, 559 FIFTH AVENUE, NEW YORK Rouse & Goldstone, Architects.



JOHN LEVY GALLERIES, 559 FIFTH AVENUE, NEW YORK.

Rouse & Goldstone, Architects.

GARDEN FRONT, HOUSE, EGERTON L. WINTHROP, SYOSSET, LONG ISLAND.

Delano & Aldrich, Architects.

ENTRANCE FRONT.

GARDEN.

Delano & Aldrich, Architects.

HOUSE, EGERTON L. WINTHROP, SYOSSET, LONG ISLAND.

LIBRARY.

DRAWING-ROOM.

Delano & Aldrich, Architects.

HOUSE, EGERTON L. WINTHROP, SYOSSET, LONG ISLAND.

LIBRARY.
HOUSE, EGERTON L. WINTHROP, SYOSSET, LONG ISLAND.

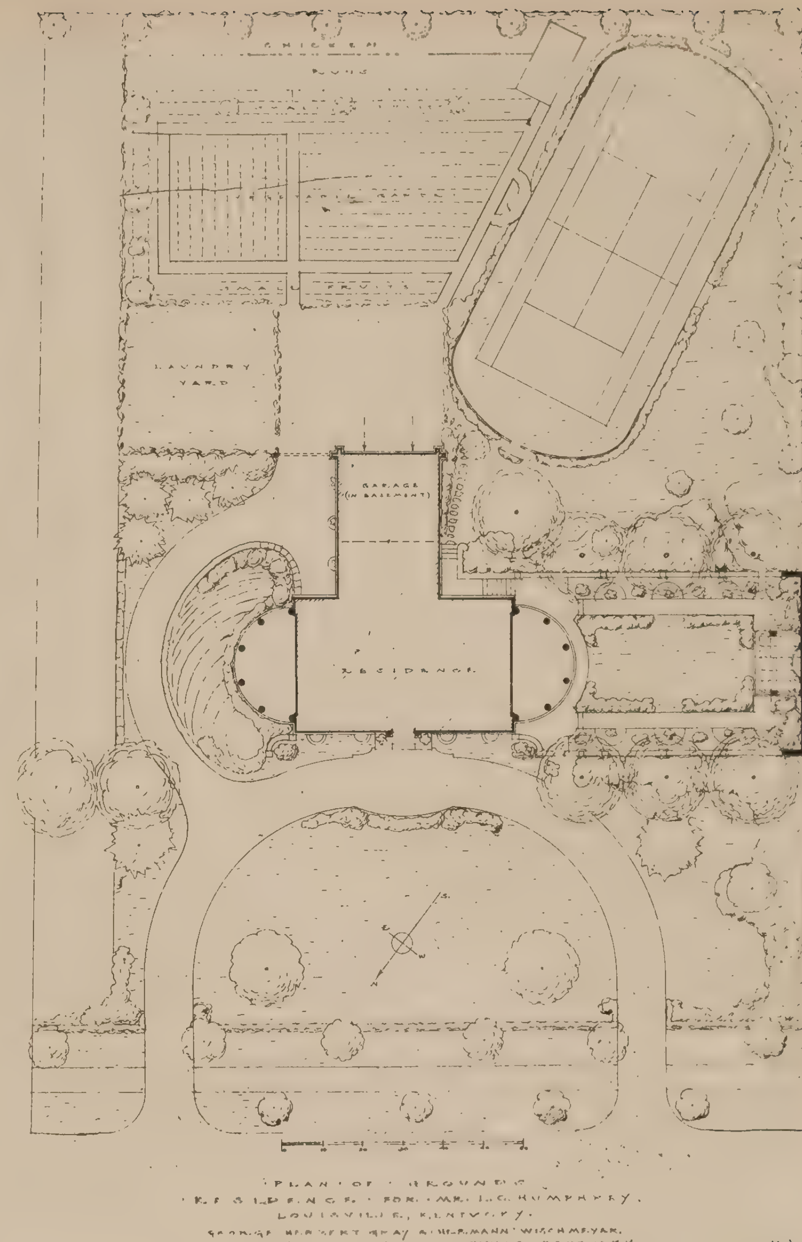
Delano & Aldrich, Architects.

RESIDENCE, LEWIS C. HUMPHREY, LOUISVILLE, KY.

George Herbert Gray, Herman Wischmeyer, Architects.

RECEPTION HALL.

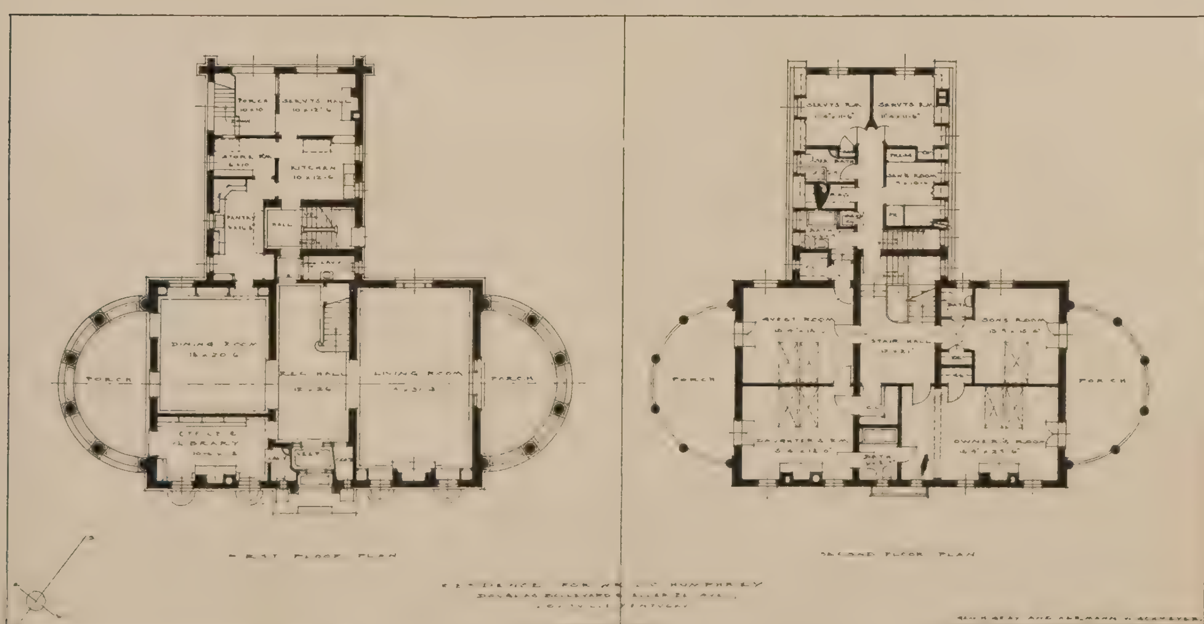
DINING-ROOM.



George Herbert Gray, Herman Wischmeyer, Architects.

RESIDENCE, LEWIS C. HUMPHREY, LOUISVILLE, KY.

OFFICE AND LIBRARY.



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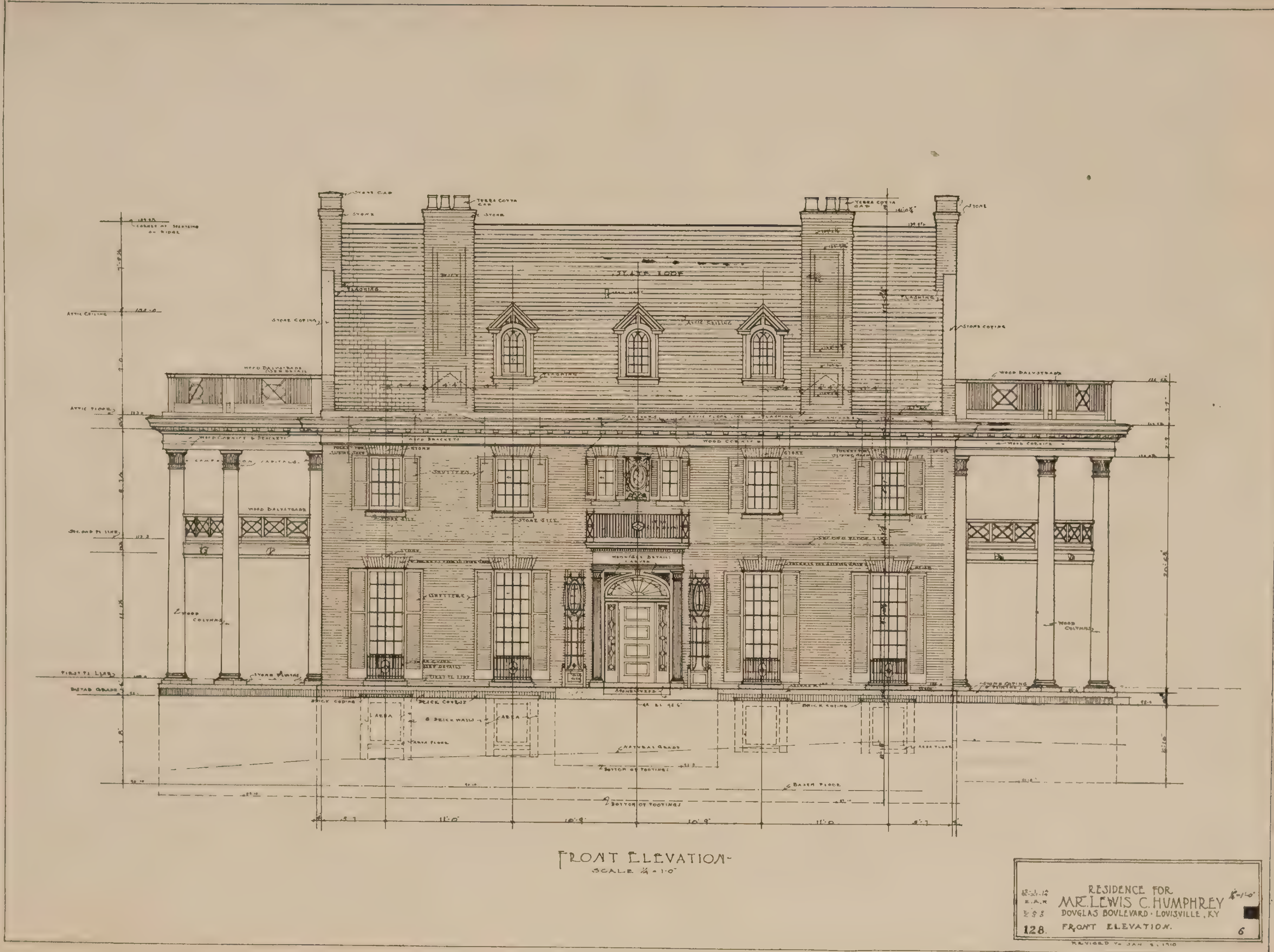
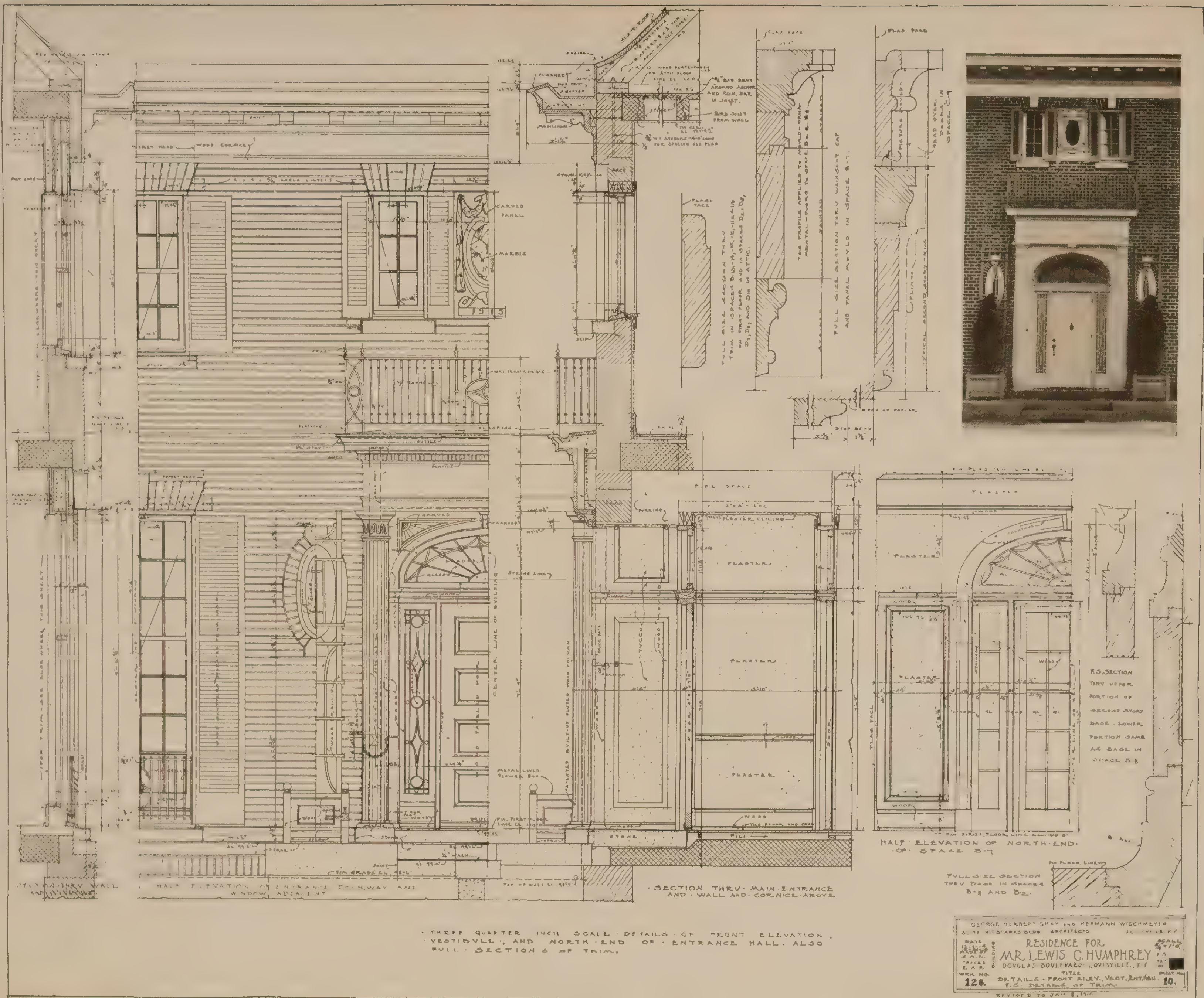


George Herbert Gray, Herman Wischmeyer, Architects.



George Herbert Gray, Herman Wischmeyer. Architects.

NEW OFFICES, W. R. GRACE & CO., LIMA, PERU.

James Wm. O'Connor, Architect.

DETAIL OF FAÇADE.

GENERAL OFFICE.

James Wm. O'Connor, Architect.

NEW OFFICES, W. R. GRACE & CO., LIMA, PERU.

New Offices of W. R. Grace & Co., Lima, Peru

James Wm. O'Connor, Architect

THIS is the first steel-frame building to be erected in Lima, and also the first building having modern equipment in the way of plumbing fixtures and fittings, the concealing of all telephone and lighting wires in conduits, and the electrical operation of clocks from a central master clock. The construction work was done largely under pioneering conditions, and the men employed were for the most part untrained Cholo Indian laborers. All of the material was delivered at the site in three-mule two-wheeled carts, and this transportation system leaves quite a little to be desired. However, the work was carried through successfully, and as a result Lima has made a long step forward toward good architecture and permanent construction.

Main entrance to new offices, W. R. Grace & Co., Lima, Peru.

The exterior, which is reminiscent of the French Renaissance, has been executed in granite and white cement stucco, the granite having come from the nearby quarries of Amancaes, and conveys at once a dignified and massive appearance. The iron and bronze work of the doors and window grilles, all of which was made in New York City, are particularly pleasing.

The arrangement of the interior consists of a large general office, which is entered directly from the street. The office is 120 feet long, 70 feet wide, and 40 feet from floor to ceiling. In it are located the cash and cable departments directly opposite the entrance, the steamship, executive and indent departments to the left, and the general merchandise and engineering departments to the right. This room is in the Tuscan order, and its great size and the harmony of its design and color make it very impressive. The ceiling, which is of stucco heavily ornamented, is supported by eight columns. The columns and walls are of Caen Stone Cement. Between the columns the ceiling is carried up twelve feet above the general level in a farola that is surrounded with windows, giving light and ventilation. The cash and cable department enclosure is of Botticino marble, and the balustrade surrounding the public waiting space is of the same. The floor is of pink Tennessee marble tile, excepting that portion occupied by the cash and cable departments, which is of cork tile. This general office is virtually a copy of the main room of the Grace office, Hanover Square, New York City.

Directly below the cash department are two vaults, each of which has a heavy manganese steel, fire-proof door. The walls of these vaults are of massive concrete heavily embedded with steel rails and bars. At the left of the main office is a two-story section containing, on the ground floor, the manager's private office, the board room, and the mail department, and on the upper floor, the mail-order, sample, and catalogue rooms.

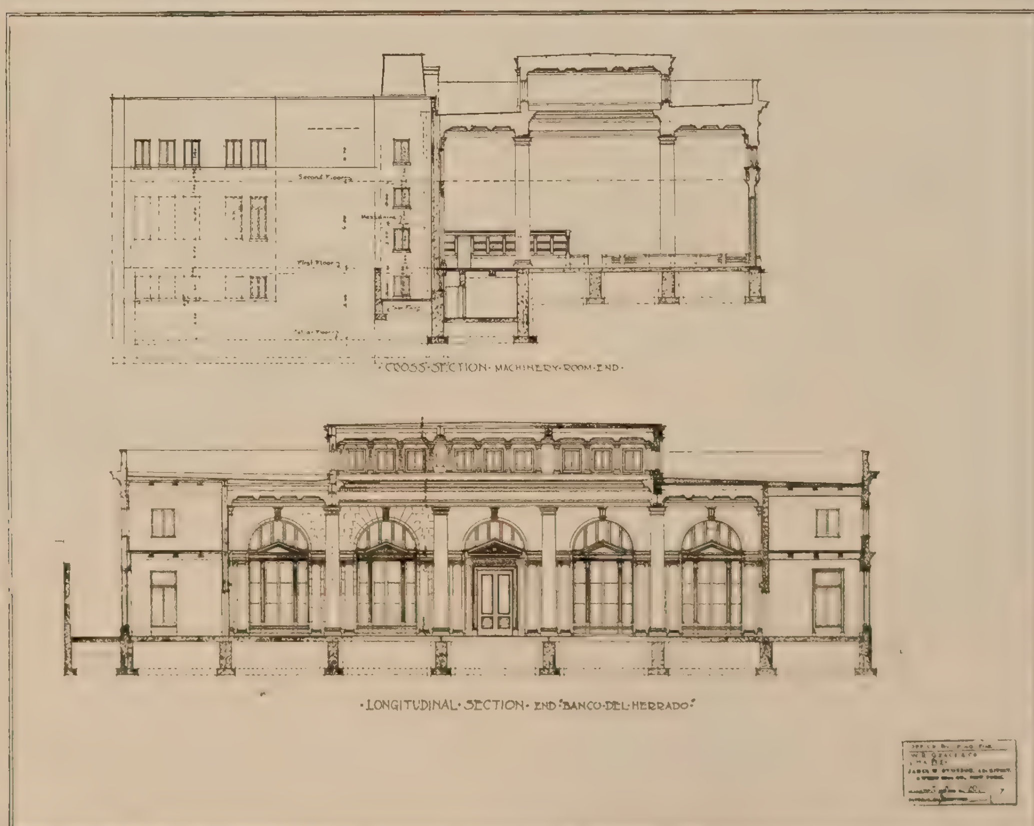
The basement is served by an electrically operated elevator, which has a lifting capacity of 3,000 pounds. The roof is finished with an impermeable felt and asphalt composition, and forms an attractive promenade. From it can be obtained an excellent view of the city of Lima, and also in the distance the Pacific Ocean.

The general appointments and equipment of the building are modern in every detail. Every office room is equipped with an electric clock, each of which is operated from a master clock located in the mail room. There are ten secondary clocks and with this system a uniform time is maintained throughout the building. The central telephone switchboard is also located in the mail room, which thus becomes the centre of all mail, telephone and time communication.

The furniture throughout the building is finished to the color of mahogany, and has been purchased or especially designed. In this way there is uniformity of equipment throughout. The desks, tables, and cabinets are all of Nicaragua cedar and have been made in Lima factories.

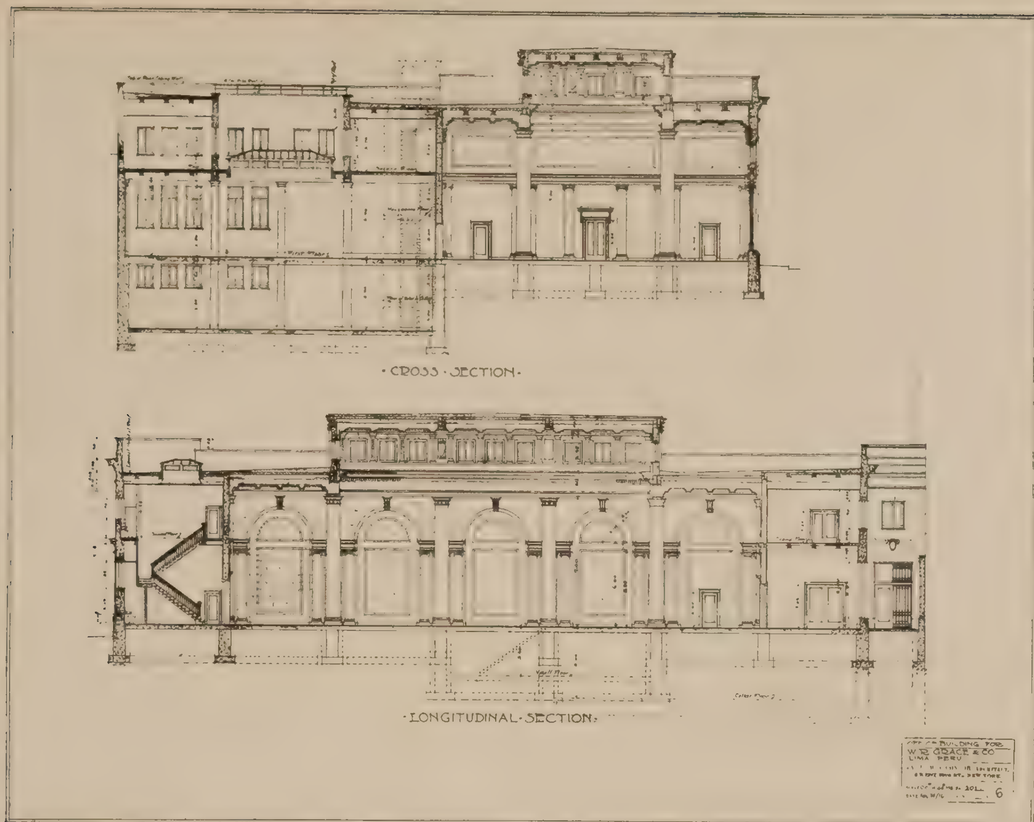
The floors of all the offices, except the main office, are covered with a heavy battleship linoleum, a material which is very resilient and comfortable to walk upon, and which silences all footsteps.

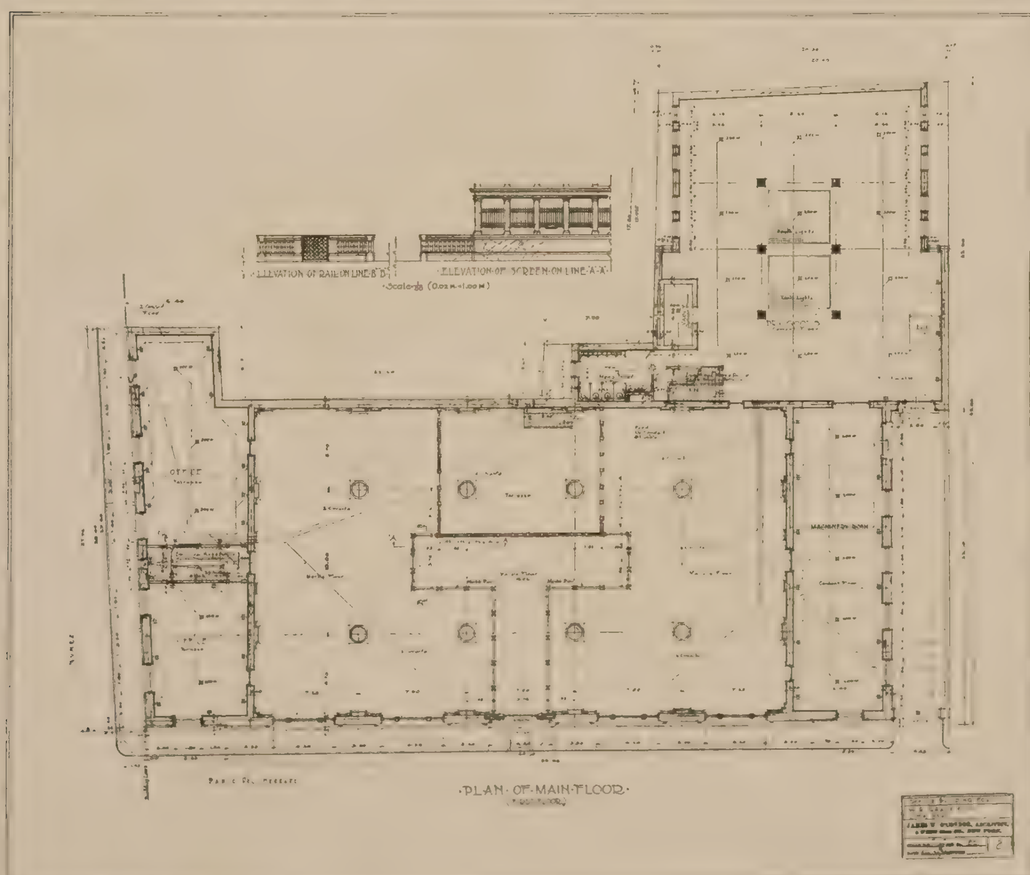
Work of construction was begun on December 11, 1916. The erection of the steel frame began March 16 and was finished June 15, 1917. The building was completed March 1, 1919. The frame of the building consists of structural steel columns and beams, and the walls, floors, and roof are reinforced concrete. The architect is Mr. James W. O'Connor, of New York, and the resident engineer in charge of the construction is Mr. F. Lynn Palmer, also of New York.



James Wm. O'Connor, Architect.

ELEVATION AND LONGITUDINAL SECTION, NEW OFFICES, W. R. GRACE & CO., LIMA, PERU.





James Wm. O'Connor, Architect.

SECTIONS AND PLAN, NEW OFFICES, W. R. GRACE & CO., LIMA, PERU.

An Accounting System for an Architect's Office

By H. P. Van Arsdall

Of Samuel Hannaford & Sons, Architects, Cincinnati, Ohio

FOR a great many years the architectural profession has been groping in the dark, and endeavoring to find some logical and accurate method of keeping accounts. The writer, after ten years' experience, has attempted to formulate a system which, he believes, will be accurate and simple.

The architectural business is operated somewhat on similar lines to a doctor's or a lawyer's office—it is strictly a professional service. It contemplates the furnishing of plans and specifications and the supervision of the actual construction of buildings. Frequently no supervision is performed. This especially applies to out-of-town work.

The American Institute of Architects has established a scale of fees to which we are obliged to strictly adhere. These fees are charged, regardless of whether or not we make or lose money on a particular job. The fee is a percentage, based upon the cost of the completed structure. There are cases where a flat charge is made for consulting service.

Unfortunately, plans and specifications are frequently made for a proposed building, and, on account of some unforeseen obstacle, the work is abandoned. In this case it becomes necessary to charge your client for the cost of preparing the drawings, plus a reasonable margin of profit. Often this leads to serious controversy, due to the inefficient cost system that is now in vogue, and it has been this, more than anything else, that has led the writer to devise the following system of accounting.

It might be well to mention the fact that the great majority of architects have kept their records on the Receipt and Disbursement basis. This system is entirely inadequate, and violates all principles of accounting.

The general records, as designed, contemplate keeping the books on the so-called Accrual System.

The following Classification of Accounts is recommended for a small or large office. It can be expanded or contracted in order to meet individual needs.

CLASSIFICATION OF ACCOUNTS

1. Assets:
    - 11. Fixed Assets:
        - 111. Office Furniture and Fixtures.
        - 112. Books.
        - 113.
        - 114.
        - 115.
    - 12. Current Assets:
        - 121. Imprest Fund.
        - 122. Cash in Bank.
        - 123. Accounts Receivable. (Controlling.)
            - A.
            - B.
            - C.
        - 124. Sundry Debtors. (Controlling.)
            - A.
            - B.
            - C.
        - 125. Investment. (Bonds.)
        - 126. Materials and Supplies on hand.
            - 1261. Printing and Stationery Materials.
            - 1262. Drawing Materials.
        - 127.
        - 128.
        - 129.
    - 13. Prepaid Accounts:
        - 131. Prepaid Insurance.
        - 132. Advances.
    - 14. Working:
        - 141. Work in Process. (Controlling.)
        - 142.
        - 143.
    - 15. Expenses:
        - 151. Drafting-room Salaries. (To be distributed.)
        - 152. Engineering Expense. (To be distributed.)
        - 153. Superintendents' Salaries. (To be distributed.)
        - 154. Undistributed Expense. (Overhead.)
          (Accounts 151, 152, 153, and 154 are all controlling accounts.)
            - 1541. Non-chargeable time of principal.
            - 1542. Non-chargeable time of Draftsmen.
            - 1543. Non-chargeable time of Engineers.
            - 1544. Non-chargeable time of Superintendent.
            - 1545. Overtime allowance.
            - 1546. Lost time, vacations, etc.
            - 1547. Office Salaries. (Controlling.)
                - A.
                - B.
                - C.
            - 1548. Rent.
            - 1549. Printing and Stationery.
            - 1550. Drawing Material.
            - 1551. Telephone and Telegraph.
            - 1552. Membership and Dues.
            - 1553. Donations.
            - 1554. Light.
            - 1555. Insurance.
            - 1556. Travelling.
            - 1557. Periodicals.
            - 1558. Legal and Accounting.
            - 1559. Taxes.
            - 1560. Depreciation of Equipment.
            - 1561. Bad Debts.
            - 1562. Miscellaneous Office.

2. Liabilities:
    - 21. Fixed Liabilities:
    - 22. Current Liabilities:
        - 221. Accounts Payable.
        - 222. Notes Payable.
        - 223. Salaries Payable.
        - 224. Sundry Creditors. (Controlling.)
        - 225. Variations and Undistributed Expense.
        - 226. Reserve for Depreciation.
        - 227. Reserve for Bad Debts.
        - 228. Accrued Expenses.
        - 229. Reserve for Lost Time, Vacations, etc.

3. Proprietary Interest:
    - 31. Capital Investment. (Controlling.)
        - A.
        - B.
    - 32. Surplus.
    - 33. Profit and Loss.

4. Operation Profit and Loss:
    - 41. Cost of Completed Work. (Controlling.)
        - A.
        - B.
        - C.
    - 42. Fees.

5. Incidental Profit and Loss:
    - 51. Incidental Income.
    - 52. Incidental Expense.
        - 521. Interest.
        - 522.

In order to more fully explain the working of this Accounting System, the writer feels that it is necessary to state the nature and purpose of all accounts under the Classification.

1. Assets.—Asset Accounts represent values owned.
    - 11. Fixed Assets.—Fixed Assets are properties owned that are necessary in the operation of the business. These assets, of course, are not to be sold. The subsidiary accounts under Fixed Assets are:
        - 111. Office Furniture and Fixtures.

112. Books.

To these accounts is charged all new equipment and books that are purchased and have a life beyond one year's time. These accounts should be depreciated quarterly, and the depreciation figured on a 10 per cent annual basis. At no time should you reduce the original book value of the asset, but on your balance-sheet deduct the allowance for depreciation in order that the original value will not be disturbed until it is completely wiped out.

12. Current Assets.—Current Assets represent values owned that are constantly changing in value. The following accounts come under Current Assets:

121. Imprest Fund.

At the beginning of operation this account is debited with a certain sum (say, $25.00), and cash credited. This sum is placed in the cash box and is to be used for paying small current bills. When the fund is nearly consumed a check is drawn for the amount of bills paid during the period, restoring the fund to its original amount, and the various bills are charged to their proper accounts.

122. Cash in Bank.—Cash in Bank should represent at all times the amount of cash owned (not including Imprest Fund). All cash receipts should be deposited in the Bank, intact, and all disbursements made by check.

123. Accounts Receivable.—This is a controlling account and receives only the monthly totals from the Journal. The subsidiary accounts controlled by Accounts Receivable represents all moneys owing by clients. When these accounts are debited with fees, Account No. 42 should be credited.

Advances paid out for clients in the way of Building and Water permits, etc., are to be charged direct to these accounts.

124. Sundry Debtors.—This is a controlling account. The accounts that are controlled are the Drawing accounts of firm members and other accounts of this nature.

125. Investments.—This account shows at all times any Bonds, Stocks, etc., owned by the firm. It is credited when the Stocks, Bonds, etc., are sold.

126. Materials and Supplies on Hand.—This account is charged with all materials and supplies purchased, and is credited monthly with all supplies used. The corresponding charge is made to one of the various expense accounts.

13. Prepaid Accounts.—The subsidiary accounts are such items as:

131. Prepaid Insurance.—This account is charged with all insurance premiums paid during the year and credited monthly with 1/12 of the total, and the corresponding charge is made to Account 1555.

14. Working Assets.—This account represents the work passing through the office. The subsidiary account is:

141. Work in Process.—To it is charged all Drafting-room expense, Engineering and Superintendents' time, and the total of the undistributed expense. This is taken from the Time Distribution Sheet and Overhead Distribution, monthly. When work is completed, this account is credited and cost of completed work debited.

15. Expenses.—The subsidiary accounts are:

151. Drafting-room Salaries Account.—This account is charged with all Drafting-room salaries, and at the end of the month is credited, and the amounts debited to proper jobs in Work in Process.

152. Engineering Expense.—This is treated the same as Account 151.

153. Superintendents' Salaries.—This is treated the same as Account 151.

154. Undistributed Expense.—This account controls the following subsidiary accounts:

1541. Non-chargeable Time of Principal.—All time of firm members, not actually chargeable to jobs, is debited to this account.

1542. Non-chargeable Time of Draftsmen.

1543. Non-chargeable Time of Engineers.

1544. Non-chargeable Time of Superintendents.

These three accounts are treated the same as Account 1541.

1545. Overtime Allowance.—To this is charged any increased rate of pay that is paid to draftsmen on account of overtime work. It is not just that any particular job should be burdened with this expense on account of it having been the particular job to rush through the office.

1546. Lost Time, Vacations, etc.—(Draftsmen, Engineers and Superintendents.)

This account is debited monthly with 1/12 of the annual amount set up in Reserve Account (229). A Reserve account for Lost Time, vacations, etc., will be set up, and the accrued expense shown as a credit each month and the same amount should be debited to this account.

When the actual money is paid out for the lost time, cash is credited, and the Reserve Account debited.

1547. Office Salaries.—This account is charged with the Salaries of the principal, the office business manager, stenographer, and office boy.

1548. Rent.—This is paid monthly and is charged as a regular monthly expense. Credit cash and debit rent when it is paid.

1549. Printing and Stationery.—Charge this account each month with the amount of materials used and credit Account 1261.

1550. Drawing Material.—Treat same as Account 1549.

1551. Telephone and Telegraph.—Treat same as Account 1548.

1552. Membership and Dues.—This account is charged with all dues, membership fees, etc. If any one month should be overly burdened, then a prepaid account should be set up and the expense distributed over the twelve months.

1553. Donations.—Treat same as Account 1548.

1554. Light.—Treat same as Account 1548.

1555. Insurance.—This account is charged monthly with 1/12 of the total prepaid insurance and credit is made to Prepaid Insurance Account.

1556. Travelling.—Debit this account with all Travelling expenses, when it is not directly chargeable to a job.

1557. Periodicals.—Debit with all magazines, papers, etc.

1558. Legal and Accounting.—Charge with all attorney and accountant fees.

1559. Taxes.—An architect's taxes are usually small, and it is not necessary to distribute the sum over the entire year. When taxes are paid, debit this account and credit cash.

1560. Depreciation of Equipment.—Debit this account, monthly, with 1/12 of depreciation charge and credit the Reserve Account.

1561. Bad Debts.—Handle same as Account 1560.

1562. Miscellaneous, Office.—Expenses of all other kinds are charged to this account (small).

2. Liabilities.—Liabilities are all values owed.

21. Fixed Liabilities.—Liabilities of a fixed nature, only, are credited to this account. Ordinarily, an architect has no fixed Liabilities, unless they have issued bonds or stocks.

22. Current Liabilities.—These are Liabilities that are alive, and are constantly changing in value. This is a controlling account, and has the following subsidiary accounts:

221. Accounts Payable.—All accounts due and payable are credited to this account.

222. Notes Payable.—Treat same as Account 221.

223. Salaries Payable.—This account will be credited at time of closing books or when the end of the month falls in the middle of the week, with all accrued salaries up to date. When salaries are paid, cash is credited and this account debited.

224. Sundry Creditors.—This account will be credited with all items not included under Accounts Payable.

225. Variations and Undistributed Expense.—Any balance at end of period remaining in Account 154, is absorbed by this Account.

226. Reserve for Depreciation.—This account is credited monthly with the regular amounts of depreciation fixed upon.

227. Reserve for Bad Debts.—This account is credited with the approximate or estimated allowance for bad debts and is charged monthly.

228. Accrued Expenses.—At the end of any accounting period, any expenses not as yet paid, but accrued, are credited to this account.

229. Reserve for Lost Time, Vacations, etc.—This account is credited monthly with 1/12 of the annual estimated lost time, etc., and the corresponding debit made to Account 1546.

3. Proprietary Interest.—This account represents the net worth of the business. The subsidiary accounts are as follows:

31. Capital Investment.—This is a controlling account, and has the following subsidiary accounts in alphabetical order, which show the original investment at start of business and represents the amounts paid in by the firm members.

32. Surplus.—All profit or loss at end of year is debited or credited to this account, as the case may be. Any dividends paid are debited to this account.

33. Profit and Loss.—All trading or operating accounts are closed into this account at the closing period, or once a year.

4. Operation—Profit and Loss.—This is a controlling account and has the following subsidiary accounts:

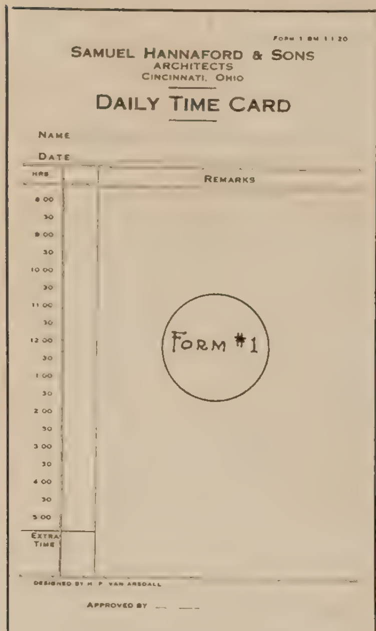
41. Cost of Completed Work.—This account is also a controlling account, and controls all jobs that have been completed. These are listed in alphabetical order, and on the completion of any job, Work in Process is credited and this account debited.

42. Fees.—When Accounts Receivable is debited with a fee, this account is credited.

5. Incidental Profit and Loss.—This is also a controlling account, and has the following subsidiary accounts:

51. Incidental Income.—This account records any earnings received outside of the regular order of business, such as money paid for renting a portion of the office to an outside person.

52. Incidental Expense.—This is a controlling account and has the following subsidiary accounts:



521. Interest.—This account is debited with any interest paid out. Interest cannot be charged as an Overhead Expense, as it shows that your collection department has been lax and sufficient funds have not been provided. It, therefore, becomes an Incidental Expense.

The forms presented for the proper operation of the system are designed to show the distribution of productive time spent on individual engagements.

The procedure is as follows:

The daily time-card (Form No. 1) is arranged in half-hour divisions, and it is a simple matter for a draftsman to indicate on the card just what particular work is performed during the day. A white card is used for productive work, and a blue card for non-productive work. It is not necessary, but advisable, that a separate card be used for each job worked on during the day, since this permits of the filing of all cards together that show time for one job. Cards are gathered up daily and are entered on the monthly individual time summaries (Form No. 2).

On Form No. 2, time for the various jobs that have been worked on during the month is listed in the columns indicated. Also, all the time that is non-chargeable to jobs is listed, and at the end of the month the total hours for each job is inserted in the "Total Hours" column, and the adjoining Amount Column contains the cost in dollars.

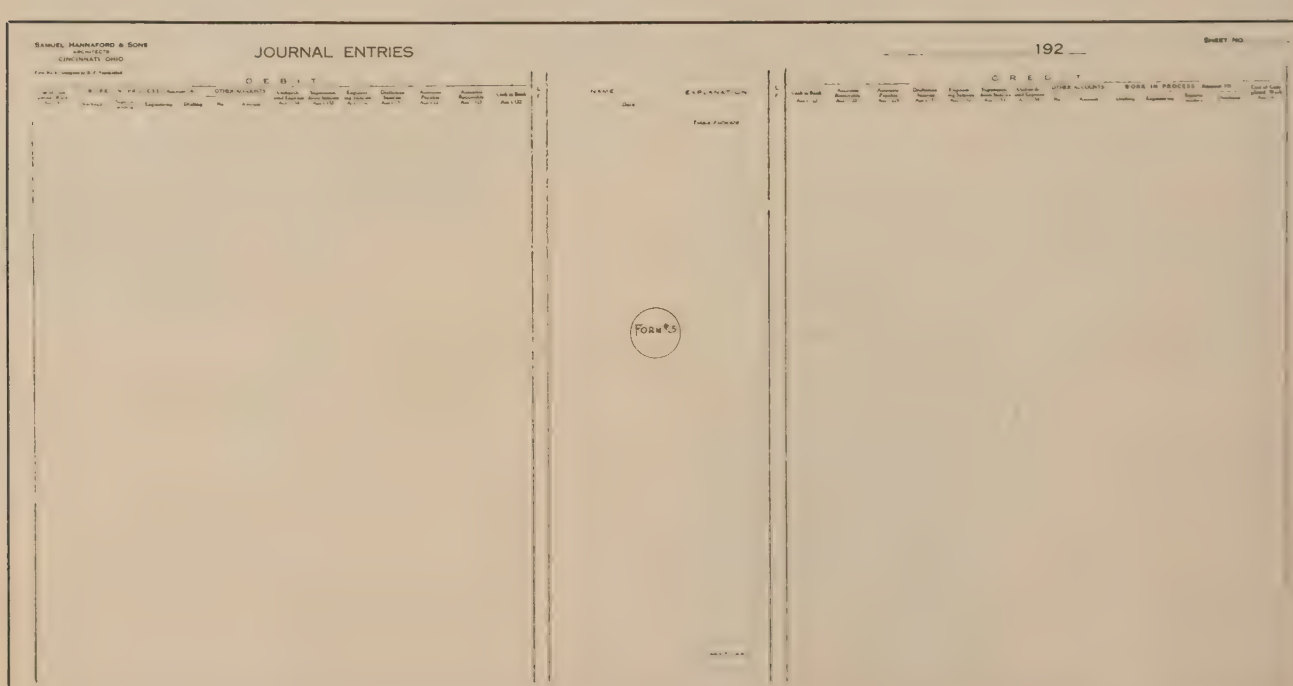
The monthly time summary for each employee is then taken and distributed on the Time Distribution Sheet (Form No. 3) to the proper jobs. You will note there is a space for each employee's account number (the account number is used instead of writing out the name), and just below it, in the corresponding column, is the total time, in dollars, for the month, opposite its particular job. The horizontal extension of this time is placed in drafting, engineering and superintending, or non-chargeable time space, as provided. These totals are then debited to Work in Process and Undistributed Expense, respectively.

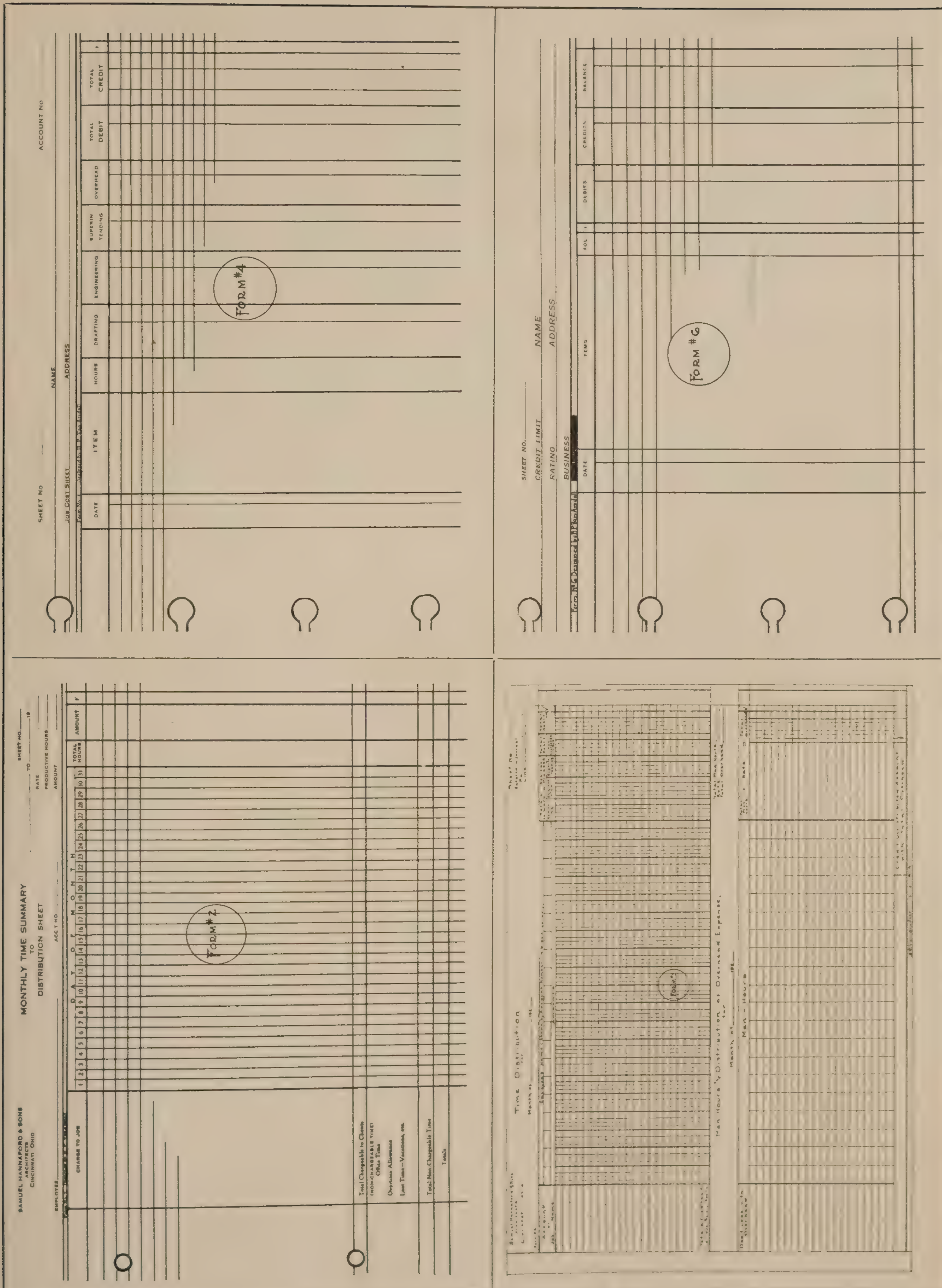
At the bottom of the Time Distribution Sheet the totals of the individual columns under employees' names are credited to the individual salaries accounts. This is done on account of charging the regular pay-roll to Salary Accounts in the ledger. When this is done it becomes necessary to credit these accounts and place these salaries into Work in Process. The reason for this is to have a record showing all salaries paid. You then enter on the journal (Form No. 5) the charges to Work in Process and charges to non-chargeable time, and credit the Individual Salary accounts.

You are now ready to distribute the Overhead Expense (Form No. 3). Since the man-hour basis for distribution is being used, we enter productive time opposite the various jobs in the columns for the various employees, and carry the total horizontally over its proper space on the right-hand side of the sheet. Since we know the total productive man-hours for the month, and the overhead for the month, the rate can be found by dividing the total man-hours into the total overhead.

When the rate has been determined, this figure is used

(*Continued on page* 116.)





FORMS 2, 3, 4, 6, ACCOUNTING SYSTEM FOR ARCHITECT'S OFFICE.

(*Continued from page* 114.)

for arriving at the overhead for each particular job during the month. Entries are then made to the journal and the various jobs charged. The total of the overhead column is then credited to Undistributed Expense, which places all of your time and overhead during the month in the proper Work in Process account.

In designing the Journal it was thought best to use one book instead of having separate journals for cash receipts, cash disbursements, and so on.

You will note that all accounts that are used frequently have been allotted special columns. Those that are infrequently used will be handled through the Other Accounts column, and be designated by their proper numbers. The necessary columns have been provided for work in process, and a single column for Cost of Completed Work.

The other forms, No. 4 and No. 6, are self-explanatory, and need no further discussion.

The forms as shown are bound in books and filed as follows:

Form No. 1, the Daily Time Cards, are filed in medium weight envelopes 5 inches by 7¼ inches. These are placed in the ordinary standard alphabetical wood file-case.

Forms No. 2 are kept in a loose-leaf binder 9 inches by 11½ inches.

Form No. 3, Time Distribution Sheet, may be folded and kept in any available file, where they are safe from fire.

Form No. 4, Job Cost Sheet, and Form No. 6, Ledger Page, compose one book, and are bound in a single binder. This binder is loose leaf, size 8 inches by 11½ inches.

Form No. 5, Journal, is a regular bound book, size 14¼ inches by 15½ inches.

The measurements given are the over-all dimensions of the binders containing the pages.

Announcements

W. R. Hill, manager of Builders' Hardware Sales for the Yale & Towne Manufacturing Company, of Stamford, Connecticut, resigned his position with that company on March 1. Mr. Hill is taking up a new line of work, in charge of sales and advertising for the Isko Company, of Chicago, Illinois. In his new field he is undertaking a line of work in which he has long been interested. The Isko Company manufacture electrically driven and automatically controlled refrigerating machines for domestic and commercial use.

Frederick Meisler has opened an office on Washington Avenue, Little Ferry, New Jersey, to practise architecture. Manufacturers' samples and catalogues requested.

The firm of Nolan & Torre, architects and engineers, with offices in the Hennen Building, New Orleans, have recently opened a branch office in Jennings, Louisiana, with C. Sedgwick Moss in charge.

Cyrus Thurston Johnston, mechanical and electrical engineer, eldest son of Clarence H. Johnston, architect, died at his home in St. Paul, Wednesday, February 25, after a brief illness. Mr. Johnston was a graduate of the Massachusetts Institute of Technology, class of '09, and at the time of his death had entire charge of the heating, plumbing, and ventilating work in his father's office. His career was one of brilliant promise, and his untimely passing is lamented by a host of friends.

J. L. Theo. Tillack, architect, wishes to announce that he has opened an office in the McFadden Building, Hackensack, N. J., and will be pleased to receive literature, samples, etc.

W. Whitehill, architect, announces the removal of his office to 12 Elm Street, New York City.

Edgar and Verna Cook Salomonsky beg to announce that they have opened offices for the practise of architecture at 368 Lexington Avenue, New York.

Changes in Personnel at Square D Company.—Several additions and changes in the sales and advertising departments of the Square D Company of Detroit, Michigan, became effective February 1. E. A. Printz, formerly district sales manager of the Chicago territory, was made sales manager, A MacLachlan continuing in the capacity of secretary and director of distribution. D. M. Stone, formerly district sales manager of the Pittsburgh territory, was made district sales manager of the Detroit territory. J. A. Jaques, formerly in charge of the New York territory as district sales manager, was given the district sales managership of the Pittsburgh territory, and H. W. Spahn, district sales manager of the Buffalo territory, was placed in charge of New York. D. H. Colcord, formerly of the department of publicity of the Westinghouse Air Brake Company of Pittsburgh, was appointed director of research engineering.

Not raising prices but increasing production is the way the Batchelder-Wilson Co., tile manufacturers of California, believe is the right way to meet present conditions.

"We invite your attention to our catalogue and price list as something unique in the present era of price raising. We have made no change in our prices, with one or two minor exceptions, from the lists established in 1918. This applies to both plain material and catalogue pieces.

"We have as many plausible excuses for raising the price of our product as any other industry. We have been steadily advancing our wage scale during the past year and a half; our raw materials and new equipment subject us to increased costs of production; our factory is crowded to the roof with orders.

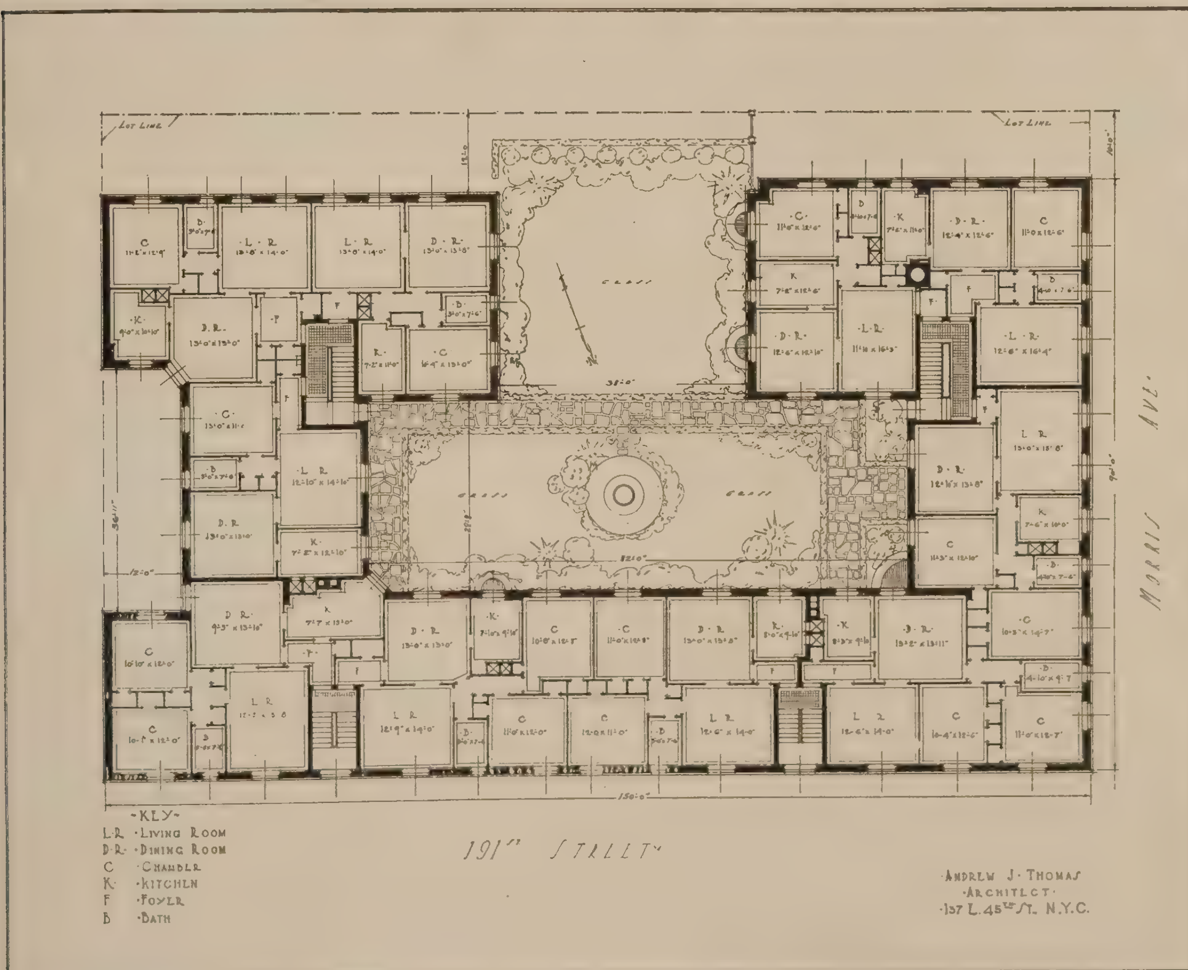
"We are meeting these increased costs by the construction of a plant, new from end to end, designed to fit the requirements peculiar to our work. In the planning and building of this plant we have given much thought to the articulation of our various processes, to the installation of labor-saving devices, and to the elimination of wastes in both management and production."

The following recent changes have been made in the organization of the Western Electric Company:

M. A. Buehler, formerly sales manager at the Omaha house, has been made sales manager at the Minneapolis office. Mr. Buehler joined the Western Electric Company's organization in the early part of 1915 and became sales manager at Omaha during the fall of 1917.

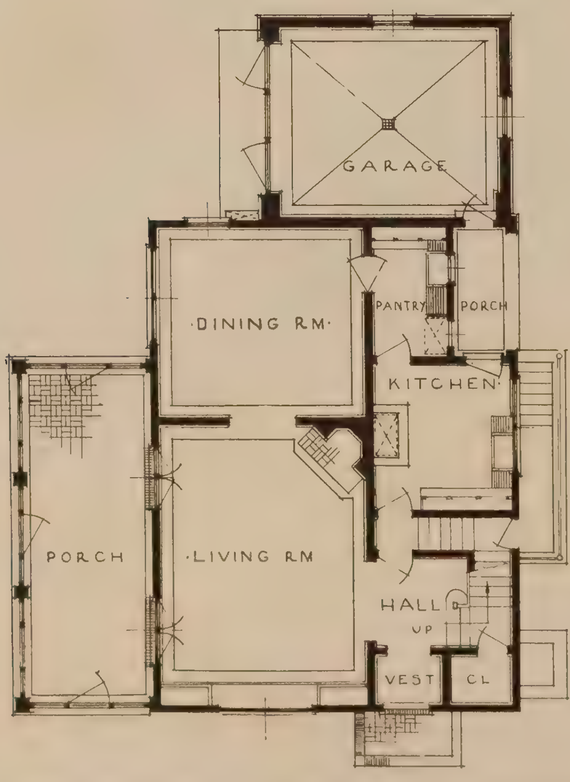
Eliot Lum has been promoted to the position of sales manager at the Omaha office, to succeed Mr. Buehler. Mr. Lum entered the employ of the Western Electric Company as a student in the educational courses in 1905, directly after his graduation from college. In 1907 he became a member of the Telephone Engineering Department at Chicago, and in 1909 was transferred to the sales department of the Minneapolis house, joining the Omaha organization in the same capacity in the winter of 1912.

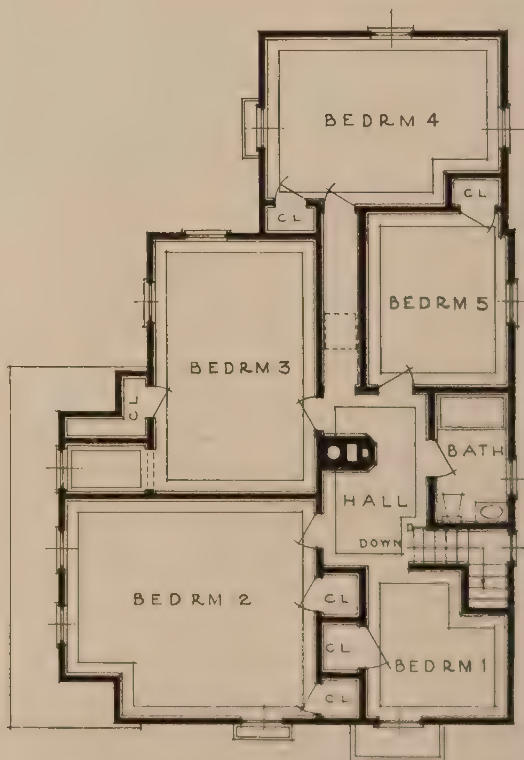
(*Continued on page* 126.)



DESIGNS FOR MODEL TENEMENT. Andrew J. Thomas, Architect.

One of the interesting plans of the year is the five-story tenement-house which is from designs by Andrew J. Thomas, architect, and is now about to be constructed at the southeast corner of Morris Avenue and 191st Street, Bronx, by Henry F. Keil, owner. This plan is unique in many respects, not the least of which is that only about sixty-two per cent of the ground area of the plot is covered with the structure. This is far short of the legal maximum, and still the tenants will obtain larger, lighter, and better-ventilated rooms than are to be found in houses which cover a larger ground space.





HOUSE AND PLANS, J. B. QUINN, FIELDSTON, RIVERDALE-ON-HUDSON, N. Y. Dwight James Baum, Architect.

DETAILS, HOUSE, J. B. QUINN, FIELDSTON, RIVERDALE-ON-HUDSON, N. Y.

Dwight James Baum, Architect.

Modern Building Superintendence

By David B. Emerson

CHAPTER VIII

ELECTRIC WIRING AND ELEVATORS

THE electric wiring conduit was installed as soon as the reinforcing for the floor slabs was in place, and before the concrete was poured. This included the conduit for telephone, bell wiring, vault signals, fire alarms, etc., as well as that for the light wiring. All of the conduit was galvanized mild, steel tubing, which was especially selected with reference to the uniformity of thickness, and each length was required to have the manufacturer's name stamped in the metal and to bear the underwriter's label. No conduit smaller than ⅝-inch inside diameter was allowed to be used. We were particularly careful to check up all of the dimensions on the plans, to be sure that all of the ceiling outlets were properly located in their relation to the rooms in which they were to occur, and that the conduit for wall brackets and switches would come in the partitions instead of out in the rooms, as sometimes happens. All cutting of conduit was done with hack saws, and after it was threaded it was reamed out to remove all burr caused by the cutting.

Bends and offsets in the conduit were avoided as much as possible, and no bends were allowed which had an inside radius of less than 3½ inches. Once or twice we found the electricians bending pipes in a vise; this was ordered stopped at once, and the crushed pipe was ordered to be removed from the building, and all bending of conduit was thereafter done by means of the conduit bending machines and hickeys, which were provided for that purpose. All conduit was put together by means of standard couplings, no running threads being allowed, and where standard couplings could not be used condulet unions were required to be used, and all joints were made tight with white lead. All mains were run in the pipe shaft which was provided for that purpose, and they were secured to the steel beams by means of pipe straps.

Distributing panels were located on each floor, and the conduit runs all started at the panels and had junction or pull boxes located where necessary. Panels were of black enamelled slate, with thirty ampere knife switches and enclosed fuses mounted in two vertical rows, and cross connected by means of metal strips to polished copper bus-bars running up the centre of the panel. These bus-bars were fitted with lugs at their ends, to which the mains were connected. Panel was surrounded with a one-half-inch thick slate frame, or barrier, with opening through which the circuit wires passed to connect with the branch switches. The panels were mounted in cabinet boxes, made from one piece of No. 10 gauge sheet steel, lapped and riveted at the four corners, with a ¾-inch flange turned inwardly all around the outside edge. The cabinet boxes had a 4-inch gutter space, in which the circuit wires were carried from the switches to the ends of the conduit, which terminated in the boxes. The boxes had No. 10 gauge steel doors, lined with slate, and provided with locks to prevent unauthorized persons tampering with the fuses or switches.

The junction, outlet, and switch boxes were of galvanized pressed steel, No. 14 gauge, with knockouts to provide holes for the entrance of conduits. Conduit was secured to the boxes by means of lock nuts and bushings. All of the outlets for lighting fixtures were fitted with insulated fixture studs of malleable iron to screw into the boxes, and the large fixtures in the main corridor had fixture hangers which were independent of the box. All conduit was properly grounded. Grounding was done by bonding all of the separate sections of conduit together, and then grounding the entire system to the water supply on the street side of the meter. This was done by means of grounding clamps, secured to the pipes, and ground wires attached to these clamps. The ground wires were of copper No. 10 B. & S. gauge, where the largest wire contained in the conduit was not greater than No. 0 B. & S. gauge, and No. 4 B. & S. gauge when the largest wire contained in conduit was greater than No. 0 B. & S. gauge. The grounded pipes were carefully cleaned of all rust, scale, etc., at the point of attachment before putting on the ground clamps. The conduit for telephone wires was installed on all floors, running from each office to the pipe shaft, up which the telephone company was to run its cables. Also conduit was run under the floors in the various offices with wall outlet, so that bell wiring might be installed by the tenants as desired. The conduit for the vault signals and the vault lighting was installed in the walls of the bank and safe-deposit vaults before the concrete was poured. All of the conduit were plugged as soon as they were installed, to prevent water or dirt entering them during the progress of the work before the wires were drawn.

The current furnished by the local lighting company was, as is almost universal throughout the country, alternating current: 220 volt, three phase, sixty cycle, for power, and 110–220 volt, single phase, for lighting; wired three wires 220 volts on positive and negative and 110 volts on the neutral. Two services were provided, one for the lighting circuits and the other for the power circuits. The transformer vault was constructed entirely of brick and concrete, with a ventilator through the sidewalk, and provided with a tin-covered fireproof door large enough to take transformers through in case of renewals. Iron sleeves were built into the walls for the conduit to pass through. The feeders were run from the transformers to the switchboard, which was located in the basement in close proximity to the pumps, etc., and handy to the boiler-room, so that the mechanical control was well centralized. The switchboard was made up in two units, one for the lighting circuits and the other for the power circuits.

The switchboard was placed so as to reduce the danger of communicating fire to any combustible material to a minimum. It was set out three feet from the wall, so as to be thoroughly accessible from the back, and was designed so that the top of the board was three feet below the ceiling. The board was made up of marbleized slate, one and one-half inches thick. Slate was carefully examined to see that it was entirely free from metallic veins, which might cause short circuits and other trouble. It was mounted in a pipe frame, which was securely fastened to the floor, and braced back to the wall by means of pipe braces, which held it perfectly rigid. The meters were mounted on the switchboard, and it was equipped with all the necessary main switches and circuit switches. All of the switches were three pole knife

switches. Light outlets were located on each board, so that the instrument might be plainly seen at all times.

As direct current was required for the motors for the passenger elevators, two motor generator sets, one light and one heavy, for rectifying the current were provided. They were located in the basement convenient to the switchboard, and the feeders were run to them and then run up to the pent-houses on the roof, where the elevator machinery was located. As the freight elevator and sidewalk hoist used alternating current, the feeders were run directly from the switchboard to the motor outlet for these machines. Feeders were also run from the power switchboard to all of the other motor outlets, and terminated in the starting-boxes which were provided for each motor.

The building now being almost completed, and all constructive work finished, the wires were drawn into the conduit. All wire was the best quality annealed copper wire, tinned, insulated with a 30 to 33 per cent rubber covering, and then covered with a protecting braid. No wire smaller than No. 14 B. & S. gauge was allowed to be used, and all wire of No. 8 B. & S. gauge or larger was required to be stranded. All splices in wire were made in the outlet boxes. The splicing was done by stripping the insulation and braid off the ends of the wires, scraping them clean, and twisting the ends together, making them mechanically and electrically secure without the use of solder, then they were soldered for protection from corrosion, and thoroughly taped with rubber and friction tape. The stranded wire was connected by means of solderless cable connectors and then covered with an insulation equal in thickness to that on the wires. The fire-alarm system was included in the equipment of the building. Fire-alarm boxes were finished in fire-alarm red and bronze, of the break-glass type, and were located in the corridors on every floor. They were connected to the city fire-alarm system by the fire department.

When the interior finish had been put up and the finished floors were laid, the switches, base receptacles, and floor receptacles were installed. The switches in the corridors and other parts of the building which were open to the public were lock switches; all other switches were three-way or single-pole tumbler switches. The outlets for the base receptacles were wired for a capacity of 300 watts, and the receptacles were of the double type, so that two plugs could be inserted and two fixtures served. The floor boxes were of the water-tight, adjustable type, with galvanized cast-iron box bodies fitted with rubber gaskets and water-tight brass covers. When the installation of the wires was entirely completed, each circuit was tested out with a meggar. The testing was done by connecting a wire on one side of the circuit to the binding-post of the meggar, marked "Line," and with another piece of wire connecting a water pipe to the "Earth" binding-post of the meggar, then turning the generator handle on the meggar, and the resistance of the insulation in ohms was shown on the dial of the instrument. The resistance, in all cases, was found to meet with the requirements of the National Electric Code and the city rules, and the system was accepted.

An intercommunicating telephone system, arranged for selective ringing and selective talking, was installed in the bank. It was equipped with an automatic switchboard, with stations located in the offices, safe-deposit vaults, and all cages and desks throughout the banking room. The wiring for the telephone system was run in conduits, as before stated, and the wires were stranded cables containing one pair of No. 22 B. & S. gauge conductors and one pair of No. 16 B. & S. gauge conductors for talking and ringing batteries respectively. Each pair of wires was twisted and all wires were twisted around each other to eliminate cross talk and induction noises. The wires were of annealed copper, insulated with silk and covered with beeswax as a moisture repellant, and then covered with a lead sheath $\frac{1}{64}$-inch thick; and each pair of wires was of a different color so as to be easily distinguished. The cables were fanned out and properly laced in an orderly manner and secured to the connecting terminals, one of which was provided for each wire. The batteries were storage batteries, equipped with an automatic charging device, taking current from the light service. The bank and safe-deposit vault were wired for an electric-alarm service, which will be described in the coming chapter.

The building had twelve passenger elevators of the one-to-one gearless traction type, one freight elevator of the single screw, worm-geared traction type, and an electric sidewalk hoist running from the sub-basement to the sidewalk. The passenger elevators had a speed of 450 feet per minute for the local cars, and 600 feet per minute for the express cars. The freight elevator had a speed of 350 feet per minute and a lifting capacity of 4,000 pounds, and ran from the sub-basement to the roof.

The machinery for both the passenger and freight elevators was located in the pent-houses on the roof, directly over the cars, with a clearance of eight feet between the supporting beams and the top of the cars. The machines for the passenger elevators consisted essentially of the motor, the traction driving-sheave, and the magnetically released spring applied brake, grouped together and mounted on a continuous heavy cast-iron bed. The motors were slow speed, shunt-wound motors, specially designed for this service, the brake-pulleys and driving-sheaves were mounted on the armature-shafts which were of high tensile steel and supported the loads. The controllers were located as close to the machines as possible, but allowing enough space between them to work around them.

The machine for the freight elevator was of an entirely different type, having a multi-groove driving-sheave and a non-vibrating idler; the car and counter-balance weight hanging directly from the driving-sheave. Drive was obtained by means of right and left hand worm-gears, coupled directly to the electric motor, running submerged in oil, and meshing with two large gear wheels which mesh with each other, thus giving a three-point drive. Machine was also provided with extra gears, which doubled the lifting capacity and at the same time reduced the speed to one-half, to be used when required for lifting safes or other heavy loads. Heavy iron clips were fastened to the main guides at each floor, which, when tightened up, held the car level at the floor when taking on or taking off heavy loads. The cast-iron brackets for supporting the guides for cars and counter-weights were put in place as soon as the steel frame was erected, and the guides were then installed. The main guides were planed steel, tees, 5 x 3½ x ⅝ inches, reinforced with 7-inch channels, bolted to the tees every six feet by means of two ⅝-inch tap bolts. The ends of the tees were tongued and grooved to form matched joints. The counter-weight drives were 3½ x $2\frac{7}{16}$ x ⅝-inch tees.

The passenger elevators had steel pans at the foot of the shaft, giving a clearance of eight feet at the bottom, with oil cushion buffers, one under the car and one under the counter-weight, which were arranged to bring either the car or the counter-weight to a gradual positive stop through the displacement of the oil in the buffers. The car slings, which are the frames holding the cars, were made up of structural steel channels, reinforced with steel gusset plates.

(*Continued on page* 124.)

The Roslyn Memorial Building

THROUGHOUT the length and breadth of the country memorials in honor of the dead of the recent war are in contemplation, or in process of erection, and the most popular and practical form which these memorials have taken is based upon the community building idea, which has acquired such a firm hold on the popular imagination, and has been found particularly suitable to local needs in our cities, towns, and villages.

The Roslyn Memorial Building is of this type. Planned to conform to the requirements set forth by the committee in charge of the erection of this structure, it is designed in the style of architecture strongly influenced by the local Colonial type.

The site of this memorial is centrally located on a prominent thoroughfare of the town, the land sloping sharply from the street. At the rear end of this property is an existing building which has been used as a Neighborhood House, and it is to be used in connection with the new building.

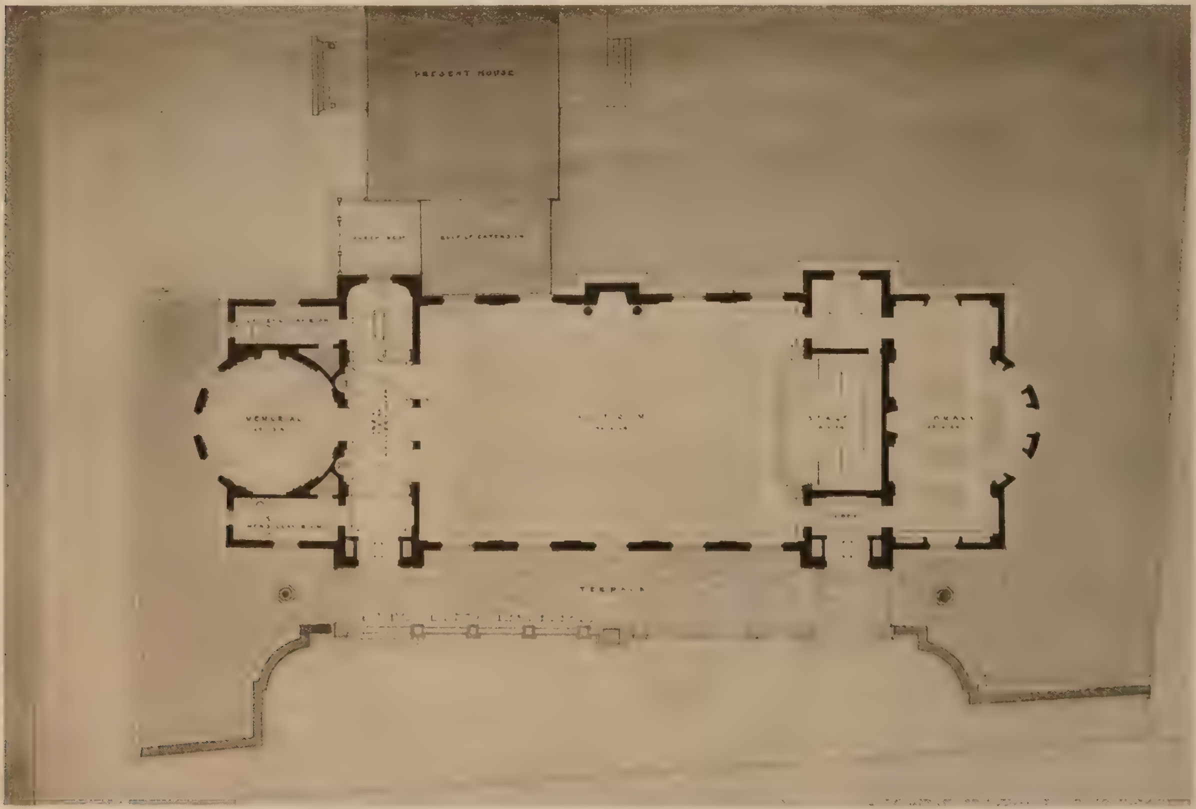
To effect properly this combination, we have placed the memorial building with its length parallel to the street, in such a position that with a small addition to the Neighborhood House, the two buildings are joined at the basement level.

In this manner the new building forms a screen to this annex, which is to be used for administration purposes, heating-plant, and kitchen service, for such entertainments as may be held from time to time in the memorial building. The main auditorium is placed in the centre with large windows on both sides, giving excellent ventilation as well as permitting a very rapid emptying of the building upon the terrace side, on which these windows open. At one end of the auditorium has been placed a modern stage, with direct connections to the dressing-rooms below, and with an easy access to the library, which adjoins; this permits a speaker to reach the stage quickly and without discomfort. At the other end of the hall is a staircase, giving access to a balcony above, and to the meeting-rooms in the basement. This hall opens into the memorial room itself, with its two flanking coat-rooms or offices, as well as giving the main public access to the auditorium. The memorial itself is a circular room on the walls of which can be placed memorial tablets and a repository for articles typical of a war museum. In the basement ample light is obtained for reading-rooms, bowling alleys, dressing-rooms, etc., this entire space being available for this purpose owing to the heating plant and its accessories having been installed in the annex building.

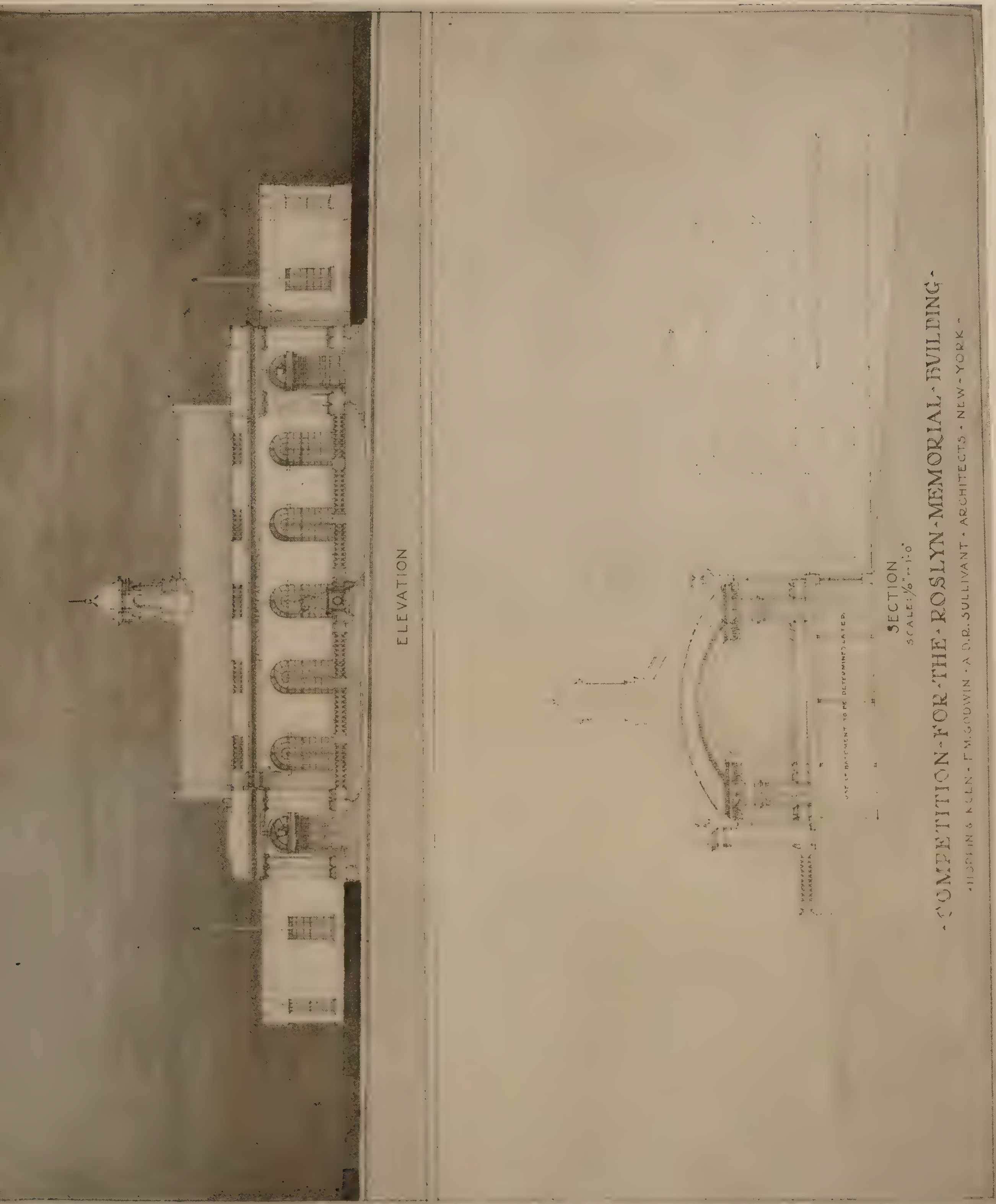
The interior will be treated in the simplest type of Colonial architecture, depending rather on form and color for its interest than on ornament.

The auditorium has been designed with a large fireplace, and so arranged that the formality of an auditorium can be removed to give the aspect of a social living-room, and it can be also adapted for athletic sports in the way of basket-ball and such interior games.

It is proposed to build the building of brick, trimmed with limestone.



Competition for Roslyn Memorial. Hoppin & Koen, F. M. Godwin, A. D. R. Sullivant, Architects.


ELEVATION
SECTION
SCALE: 1/8" = 1'-0"
· COMPETITION · FOR · THE · ROSLYN · MEMORIAL · BUILDING ·
· HOPPIN & KOEN · F. M. GODWIN · A. D. R. SULLIVANT · ARCHITECTS · NEW · YORK ·

(*Continued from page* 121.)

The platform set in the slings and consisted of angle-iron frames, with wood filler pieces 1¾ inches thick, and a ⅞-inch maple underfloor; the under sides of platforms were covered with No. 18 gauge sheet metal for fire protection. The passenger cars were made of furniture grade sheet steel, panelled, with grill work on top; all enamelled to match the steel trim used throughout the building. The floors in the car were of cork tile.

The hoisting cables were a six-strand, nineteen-wire, mild steel hoisting rope, made especially for use on traction elevators, where, on account of the quick starting and stopping, a stronger and lighter rope is required, and it is also more flexible to the strand for double wrapping. The cars were suspended from one end of the cables and the counter-weights from the other end; they passed partially around the driving-sheave, continued around the idler leading sheaves, thence again around the driving-sheave, thus making a complete loop around the sheaves. The hitches on the car and counter-weight cables were of the self-adjusting type, with a thimble rod for each cable, at the end of which was an adjustable socket which turned with the twisting of the rope and prevented the loosening of strands. The cables were babbitted into the sockets. Each car was equipped with a compensating rope device consisting of a sliding sheave frame in the bottom of the pit, around which travelled the compensating rope, which ran from the body of the car to the under side of the counter-weight frame; the object of this being to cancel the weight of the hoist on the long hoist in a high building. This does away with the rattling chain which we all know so well.

The counter-weight frames were composed of two channels riveted together by means of steel plates, the weights being of cast iron, so formed as to set into the flanges of the channels, and tied together by means of ¾-inch steel rods. Counter-weight screens were placed at the top and bottom of the shafts; they were eight feet high, made up of steel plates and angles, and bolted to the counter-weight guides. Each car and counter-weight had four self-adjusting guide-shoes, two at the top and two at the bottom, having bronze gibs or shoes, which were held close against the face rail by means of heavy springs, thus eliminating the wear on the body of the main guide-shoes. On each of the top guide-shoes was fastened a positive type lubricator, consisting of an aluminum box that fitted snugly around the face of the guides. This box being filled with oil, lubricates the guides by the action of a felt-wick feed. This does automatically what formerly had to be done by hand, and saves the old tedious job of greasing slides, and also allows the use of oil instead of grease for a lubricant, with the consequent cleanliness. The safeties were located on the safety channels under the cars, and were of the wedge-clamp type and were operated by a two-ball governor, which was set to a variation of five degrees above and below the car speed. These governors were located at the top of the hatch, and acted in the same manner as the common type of engine governor; when the balls fly out from excessive speed the governor rope is tripped, releasing the drum which controls the action of the wedges, which sets the clamps on the guide-rails.

The operating switches in the cars were of two-speed regulation, and had approximately six contacts, three to each side; two of these are for the common feed to the car switch, two for the reversing switch, and two for the fast and slow speed switch. In addition, the cases of the car switches were equipped with a rack emergency device, operated by a hand wheel, in case of the switch becoming inoperative. A complete signal service was installed in the cars and on the floors, the controlling mechanism of which was located in the pent-house on the roof, a motor generating set being provided there for rectifying the current. "Up" and "down" push-buttons were conveniently located on each floor; a signal light in the car was lighted a floor and a half in advance of the car's arrival at the landing at which the button was pushed. In addition, the pressure of the push-button caused the signal light in front of the approaching car to be lighted, and show which car would serve the passenger. The passenger signal was lighted three floors in advance of the car's arrival, which gives the passenger time to reach the proper doorway before the car arrives. Both of the signals are automatically extinguished when the car reaches the floor from which the call was made.

There was a transfer switch located in each car, so that if the car was loaded to capacity the operator could transfer the signal to the next approaching car, and the passenger would not have to press the button the second time. The cars were also equipped with illuminated thresholds, which contained two tubular electric-lights, the lights showing through a number of glass lenses inserted in the top and front of the platforms, the current for the lights being taken from the lighting fixtures in the cars. The sidewalk hoist was a drum-type worm-geared machine, with a speed of 50 feet per minute, and 3,000 pounds lifting capacity, operated by means of a hand rope. The car has an overhead frame for opening the sidewalk doors, and an automatic bell signal to warn persons standing on the sidewalk doors of the approach of the car.

When the installation of the elevators was completed and ready for acceptance, they were thoroughly tested out by the elevator company's representatives in our presence to see if they came up to the requirements of the specifications. The first test which was made was to see if the car would lift a specified load at the specified speed. One of the speed points was marked six feet above the bottom landing, the other about six feet below the top landing; a piece of paper was fastened at each point and the distance between the points was carefully measured. Then the car was started from the first floor with the speed load, and the time required for the car floor to pass the speed mark was noted with a stop watch. This determined whether the speed-load duty had been fulfilled. Then the maximum load was placed on the car, and the speed was taken as before. The cars were required to lift the maximum load at a speed within 30 per cent of the speed specified in connection with the speed load. With the maximum load on the car the speed up and down was taken to see that the down speed did not exceed the up speed by more than 15 per cent, with the controller in full-speed position.

After each test the motors were examined to see that they had not heated, and that all parts of the machine were working smoothly. We rode up and down in each car, and saw that there was no objectionable side or end play on the cars nor any disagreeable grinding of the cars and counter-weights. The drop test not being practicable, speed tests were made by speeding up the motors by inserting resistance in series with the shunt field. A hand rheostat of a capacity to carry the current, and connected in series with the shunt field, was employed, starting up the machine with all the resistance in this rheostat cut out. The resistance in the shunt-field circuit was cut in and increased the motor speed sufficiently to trip the governors which operated the safeties. The automatic terminal-stop mechanism was tested by running the cars at full speed into both limits of travel with the controller held over to full-speed position. All of these tests having proved satisfactory, the elevators were then put in charge of the regular operators and the service in the building was commenced.

BUNGALOW FOR GEORGE C. ST. JOHN, WALLINGFORD, CONN. Francis Waterman, Architect.

(*Continued from page* 116.)

The Portland Cement Association announces the opening of a new Association office in Portland, Oregon, at 146 Fifth Street, with Hans Mumm, Jr., as district engineer in charge, effective March 1, 1920.

Since 1903 Mr. Mumm has been engaged in various engineering work in Washington, having been county engineer of Snohomish County from 1912 to 1915, and the year following city engineer of Everett, Washington. Mr. Mumm joined the staff of the Portland Cement Association in 1916, since which time he has been identified with Association work in Washington.

Among the claims for the Vortex mechanical painter are: (1) carrying a greater volume of paint per minute, due to the fact that it is not finely sprayed but applied in a relatively heavy liquid jet; (2) better penetration of rough surfaces; (3) an efficient brushing action by the air jet which makes it possible to cover completely and smoothly with a single coat; and (4) dispensing with scaffolding very largely by use of a twelve-foot arm when desired. There is also the important advantage of having a powerful air jet at the painter's command for cleaning of dirty surfaces. Its efficiency in reaching crevices and out-of-the-way corners is considerably greater than that of the hand-painter's cleaning implements, the wire brush, putty-knife, and cloth.

Liquid Asphalt.—The Par-Lock process, which utilizes gun-driven liquid asphalt as a means of sealing voids in concrete and masonry surfaces, has been in use for seven years, during the last five years of which period it has been regarded by its sponsors as beyond the tentative stage of development. It has been employed on many large construction jobs, besides scores of smaller ones. Yet, on account of a rather diverse field of usefulness and broad claims of excellence, there has been confusion in the minds of many engineers and architects as to its exact function and advantages.

In the first place, it is necessary to distinguish between Par-Lock as a preparation of walls to be plastered and Par-Lock as a waterproofing. Yet, this distinction must again be qualified by the clear stipulation that every application of Par-Lock is a waterproofing. A basic claim for merit as a preparation for plastering is the fact that it protects the plastering from water or dampness that might otherwise enter through the ceiling or wall to which it is applied. Entirely apart from its plastering function, Par-Lock offers a specification for practically every waterproofing and damp-proofing purpose with distinct claims of advantage in relation to each.

The competition arranged by the Chicago Brick Exchange awarded the following prizes:

The first prize ($150) was won by Fred M. Hodgdon, of Coolidge & Hodgdon, 134 South La Salle Street.

The second prize ($100) was won by George Lloyd Barnum, 4846 Hutchinson Street.

The third prize ($50) was won by Willard G. Searles, Ravinia, Illinois.

The judges were: Mr. Charles S. Frost, Mr. Emery B. Jackson, Mr. I. K. Pond, and Mr. Howard Shaw.

The object of the competition was to produce a design which when built will result in a worthy display of Dearborn brick.

We have received from Redfield & Fisher, the well-known advertising agents, a loose-leafed album containing illustrations of recent work by Delano & Aldrich, New York. The purpose of the album is to show the instalments by the Lorillard Refrigerator Co.

The Advance in Building Materials Costs

WITH a big building programme projected for 1920 the price of building materials is of paramount importance. On a basis of 1907 prices as 100 per cent, we give a table of percentages of wholesale prices compiled from figures of the United States Bureau of Labor Statistics, from which may be seen the net increase in the prices of lumber and building materials.

Labor is shown to have increased 156 per cent above the average price of 1907, whereas all commodities increased 166 per cent during the same period.

At the time of the signing of the armistice the War Industries Board showed an average mill price for lumber in the United States which was only 56 per cent higher than the average price for the first nine months of 1907. Hemlock was 60 per cent higher; yellow pine, 61 per cent; plain oak, 74 per cent; Douglas fir, 41 per cent. During the same period —from 1907 to November, 1918—Portland cement had increased 71 per cent; common brick, 98 per cent; lime, 115 per cent.

For Fire Prevention

A RESOLUTION passed by the Ohio Builders Supply Association at the convention held at Columbus, Ohio, January, 1920.

Whereas, the housing shortage in the United States creates a serious situation, and

Whereas, the fire losses reported in 1917 to the National Board of Fire Underwriters amounted to $66,166,420 in 232,021 residences, and

Whereas, the cost of material and labor is constantly mounting so that individual losses are likely to be greater year by year, cutting down our national resources to a tremendous extent, and aggravating the housing situation to an unnecessary dregree,

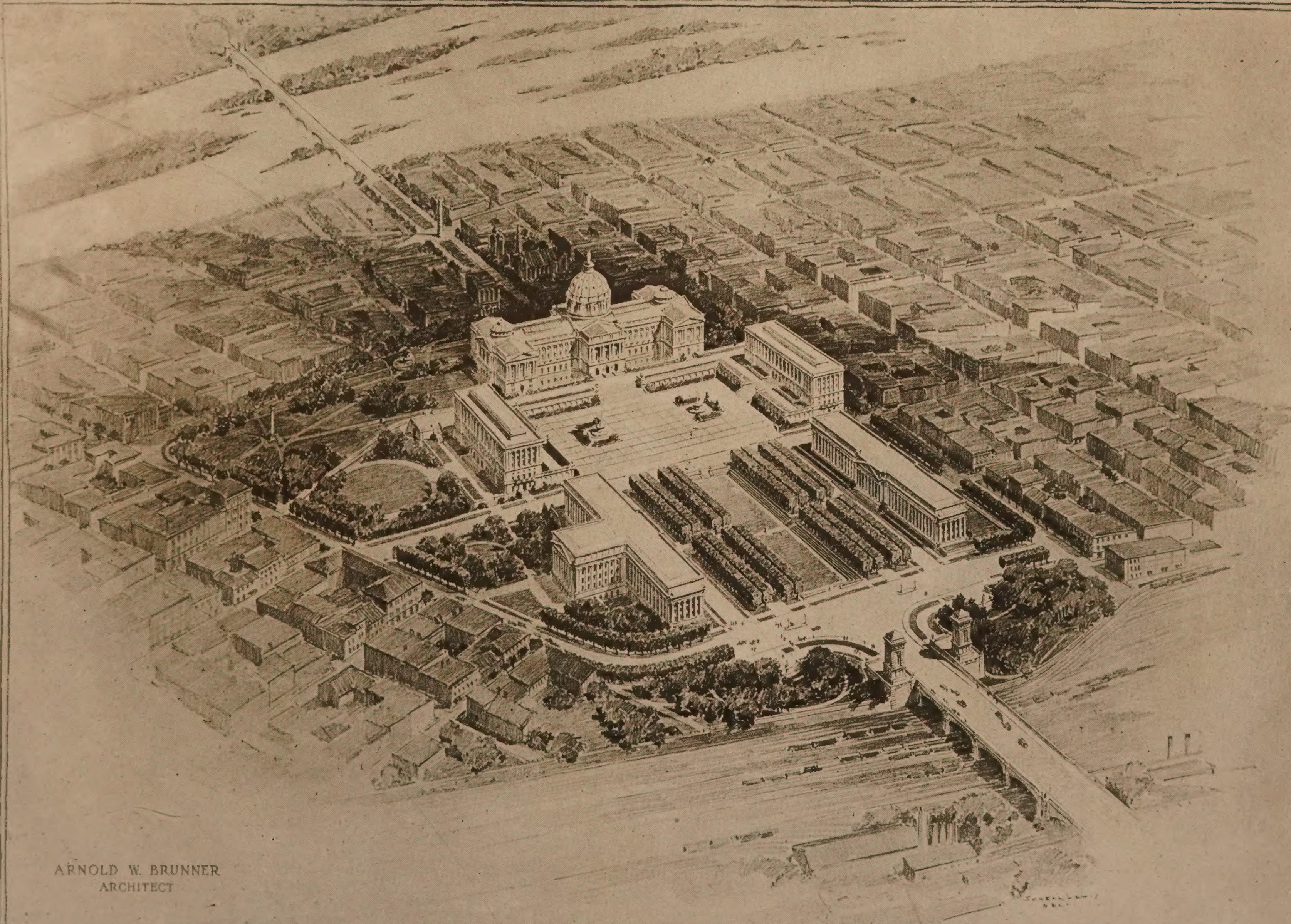
Be It Therefore Resolved, That this association go on record as to the necessity of giving more adequate fire protection to the combustible members of residences;

Be It Further Resolved, That each member of this association be requested to advise prospective owners of the situation and furnish full information as to the best available methods of protecting such structures.

The International Jury of Award for the Carnegie Institute Exhibition

JOHN W. BEATTY, director of the Department of Fine Arts, Carnegie Institute, Pittsburgh, announces the following International Jury of Award for the Nineteenth International Exhibition which opens on April 29:

Among the eminent men elected this year to serve as members of the jury are Julius Olsson from England; André Dauchez from France, who has received the gold medal at the Carnegie Institute; and eight men from America who are nationally famous. Emil Carlsen is an American of Danish birth, who is recognized as one of the able contemporary painters. Bruce Crane, whose "November Hills," now in the Permanent Collection, was awarded the third medal in 1909, like Carlsen, comes to Pittsburgh for the first time. Charles H. Davis has already served eight times on the jury and is represented in the Permanent Collection. Charles Hawthorne, Edward W. Redfield, W. L. Lathrop, Gardner Symons, and Edmund C. Tarbell have served on previous juries. Under an established rule the director is president of the jury.



GENERAL VIEW OF CAPITOL PARK
HARRISBURG PA.